PCI-6881

PCI Pentium® M Half-sized SBC with VGA/LCD/LVDS/Giga Ethernet/USB2.0 and SSD

User Manual

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This manual is for the PCI-6881.

Part No.200K688111

2nd Edition

Feb. 2006

Packing List

Before you begin installing your card, please make sure that the following materials have been shipped:

- 1 PCI-6881 Series Half-sized single board computer
- 1 Startup manual
- 1 CD for utility, drivers, and manual (in PDF format)
- 1 Power cable p/n:1700000265
- 1 Y cable for PS/2 Keyboard, PS/2 Mouse p/n:1700060202
- 1 FDD cable (600mm) p/n:1701340603
- 1 Printer port cable p/n:1700260250
- 1 ATX feature cable p/n:1700001276
- 1 EIDE (HDD) cable p/n:1701400452
- Mini Jumper p/n:1653302122

If any of these items are missing or damaged, contact your distributor or sales representative immediately.

Model No. List	Description
PCI-6881F-00A2	PCI FCPGA478 Slot PC w/LAN/VGA/LVDS/CFC
PCI-6881FG-00A2	PCI FCPGA478 Slot PC w/GigaLAN/VGA/LVDS/CFC
PCI-6881F-M0A2	PCI CeleronM 600M Slot PC w/LAN/VGA/LVDS/CFC
PCI-6881FG-M0A2	PCI CeleronM 600M Slot PC w/GigaLAN/VGA/LVDS/CFC
PCI-6881F-S0A2	PCI PentiumM 1.1G Slot PC w/LAN/VGA/LVDS/CFC
PCI-6881FG-S0A2	PCI PentiumM 1.1G Slot PC w/ GigaLAN/VGA/LVDS/CFC

Additional Information and Assistance

Visit the Advantech website at **www.advantech.com** where you can find the latest information about the product.

Step 1. Contact your distributor, sales representative, or Advantech's customer service center for technical support if you need additional assistance. Please have the following information ready before you call:

- Product name and serial number
- Description of your peripheral attachments
- Description of your software (operating system, version, application software, etc.)
- A complete description of the problem
- The exact wording of any error messages

FCC

This device complies with the requirements in part 15 of the FCC rules: Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. The user is advised that any equipment changes or modifications not expressly approved by the party responsible for compliance would void the compliance to FCC regulations and therefore, the user's authority to operate the equipment.

Caution!

Achtung!

There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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CHAPTER 1

General Information

This chapter gives background information on the PCI-6881.

Sections include:

- Introduction
- Features
- Specifications
- Board layout and dimensions

Chapter 1 General Information

1.1 Introduction

The PCI-6881 series is a half-sized PCI bus CPU card designed with powerful Intel Pentium M or Celeron M processor, with Intel 855GME and ICH4 chipset, which supports enhanced Intel "SpeedStep" technology and Dynamic Video Memory Technology. For maximum performance, PCI-6881 also supports two 200 Pin SODIMM socket and ECC DDR memory up to 2 GB. These chipsets are specifically for embedded computing and provide an optimized on-board integrated graphics solution. "SpeedStep" technology intelligently focuses system power where the CPU needs it and automatically regulates power usage to preserve battery life.

Other onboard features include 2 EIDE, 1 FDD, 1 LPT, 4 USB 2.0, 4 COM ports (3 x RS-232 and 1 x RS-232/422/485), PS/2 KeyBoard/ mouse, watchdog, and a DI/O interface. The SSD solution supports Type I/II CompactFlash cards.

This product uses a Intel 855GME that supports VGA/LVDS interface, 2 channel (36-bit) LVDS LCD panel. PCI-6881 supports AC97 audio with the addition of the optional PCM-231A-00A1 audio module.

The Ethernet interface supports 10/100Base-T by Intel 82551ER (82551QM optional), and 1000Base-T by Intel 82541PI.
Its dimension follows standard PCI slot PC, this makes it can match with all half-sized chassis and can operate in high vibration environment.

1.2 Features

- Intel Embedded new generation Pentium M (Banias) LV/ULV or Dothan Processor, up to 2.0 GHz
- Fanless operation at 0 ~ 60° C (PCI-6881F-M0A2 & PCI-6881FG-M0A2 & PCI-6881F-S0A2 & PCI-6881FG-S0A2)
- On-board PCI VGA/LVDS display
- Supports 1000Base-T Ethernet on board
- Supports 4 x USB 2.0 ports
- Supports 2 Channels 36-bit LVDS for LCD

- Supports 400 MHz Front Side Bus
- Accepts 128/256/512 bit technologies DDR 200/266/333 DRAM

1.3 Specifications

1.3.1 Standard SBC Functions

- **CPU:** Supports Intel® Embedded Pentium® M (Banias) LV/ULV or Dothan Processor, up to 2.0 GHz
- **System chipsets:** Intel 855GME +ICH4
- **BIOS:** Award 4Mbit Flash BIOS
- **System memory:** 200 pin SODIMMx2, supports ECC double data rate (DDR) 128 MB to 2 GB, accepts 128/256/512 bit technologies DDR 200/266/333 DRAM
- **2nd cache memory:** 1 or 2 MB on Pentium M processor, 512 KB or 1 MB on Celeron M
- **Enhanced IDE Interface:** Supports two enhanced IDE channels. Primary channel supports ATA-100 mode; Secondary channel only supports ATA-33 and PIO mode. CFC card occupies secondary IDE master
- **COM Ports:** Four COM ports: COM1, COM3, COM4: RS-232; COM2: RS-232/422/485
- **Printer Ports:** One printer port, support SPP/EPP/ECP
- **Keyboard/Mouse Connector:** Supports standard PC/AT Keyboard and a PS/2 Mouse
- **Power Management:** Supports Power Saving Mode, including Normal/Standard/Suspend modes. APM 1.2 compliant.
- **FDD interface:** Supports up to two FDD devices
- **DI/O interface:** 8-bit general purpose input/output
- **Watchdog Timer:** 0 ~ 255 Sec. System reset or IRQ11
- **Expansion Interface:** 32-bit PCI Slot
- **Battery:** Lithium 3V/196 mAH
- **USB:** 4 USB ports, USB 2.0 compliant

1.3.2 Display Interface

- **Chipset:** Intel 855 GME
- **Memory size:** Shared up to 32 MB, supports DVMT
- **LVDS Interface:** Supports 2 channels (36-bit) LVDS LCD Panel
- **Display modes:**

  CRT Modes: 2048 x 1536 @ 75 Hz;

  LCD Modes: up to UXGA panel resolution with frequency range from 25 MHz to 112 MHz

1.3.3 Solid State disk

- Supports **CompactFlash Card Type I/II**

1.3.4 Ethernet interface

- **Chipset:** Intel 82541PI (Gigabit), Intel 82551ER/82551QM (optional)
- **Connection:** on-board RJ-45 connector
- **Interface:** IEEE 802.3 z/ab (1000Base-T) or IEEE 802.3u (100Base-T) protocol compatible
- **Built-in Boot ROM:** 82541PI and 82551QM (optional)
- I/O address switchless setting

1.3.5 Mechanical and Environmental

- **Dimensions (L x W):** 185 x 122 mm (7.3" x 4.8")
- **Power Supply Voltage:**+5 V ± 5%, +12 V ± 5%
- **Power Consumption:**

  Max:

  6 A @+5 V, 0.5 A @+12 V

  Typical:

  5.2 A @ +5 V (w/Pentium M 1.6 G + 512 MB)

  0.25 A @ +12 V (w/Pentium M 1.6 G + 512 MB)
- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F) operation
- **Operating humidity:** 0% ~ 90% Relative Humidity, non-condensing

1.4 Board layout: dimensions

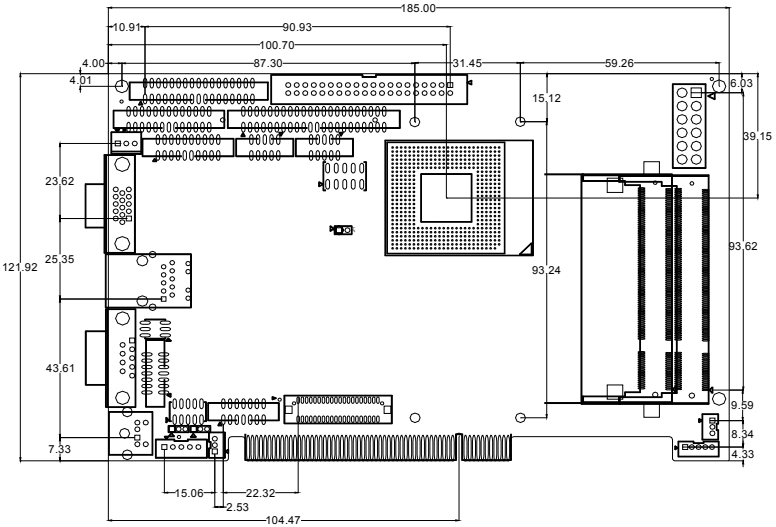


Figure 1.1: Board layout: dimensions (component side)

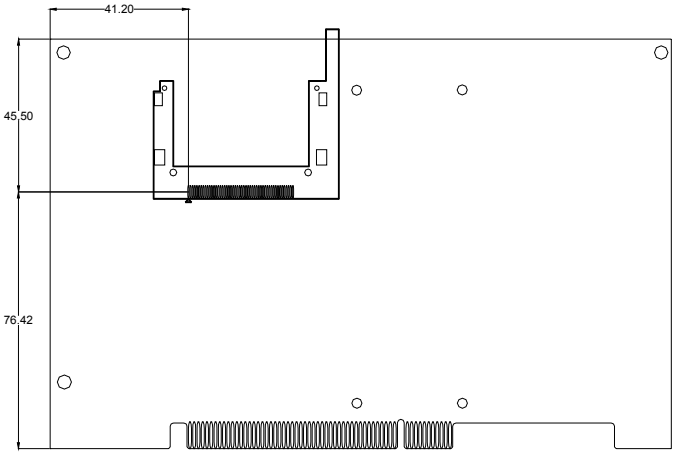


Figure 1.2: Board layout: dimensions (solder side)

CHAPTER 2

Installation

This chapter explains the setup procedures of PCI-6881 hardware, including instructions on setting jumpers and connecting peripherals, switches and indicators. Be sure to read all safety precautions before you begin the installation procedure.

Chapter 2 Installation

2.1 Jumpers

The PCI-6881 has a number of jumpers that allow you to configure your system to suit your application. The table below lists the functions of the various jumpers.

Table 2.1: Jumpers

Label	Function
JP1	Clear CMOS
JP2	COM2 RS-232/422/485 SEL
JP3	PCI_VIO Power SEL
JP4	LVDS Panel Power SEL

2.2 Connectors

Onboard connectors link the PCI-6881 to external devices such as hard disk drives, a keyboard, or floppy drives. The table below lists the function of each of the board's connectors.

Table 2.2: Connectors

Label	Function
CN1	Primary IDE Connector
CN2	Floppy Connector
CN3	Printer port Connector
CN4	Secondary IDE Connector
CN5	ATX power Connector
CN6	COM port 3, 4
CN7	USB port 1, 2
CN8	USB port 3, 4
CN9	HDD LED/Reset/Power Button
CN10	D-SUB VGA Connector
CN11	LAN RJ45 Connector
CN12	COM port 1
CN13	COM port 2
CN14	LVDS Connector
CN15	AC'97 interface Connector
CN16	DI/O Connector
CN17	MINI Keyboard Connector
CN18	External Keyboard Connector
CN19	LCD Inverter Power Connector
CN20	CompactFlash Socket
CN21	ATX Feature Connector
CN22	-12 V Power Connector

2.3 Locating Connectors (component side)

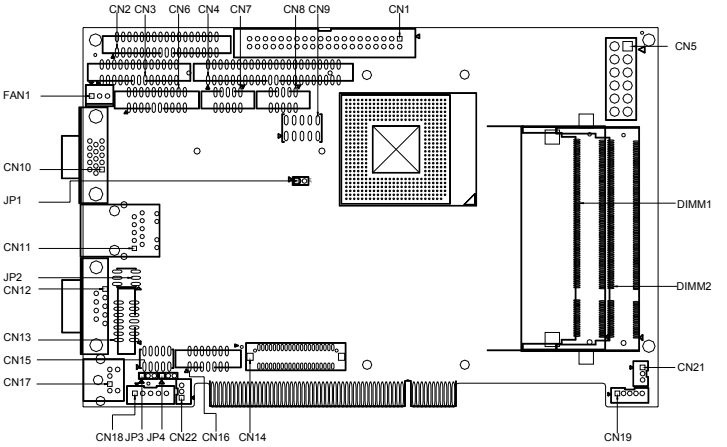


Figure 2.1: Jumper & Connector Locations

2.4 Locating Connectors (solder side)

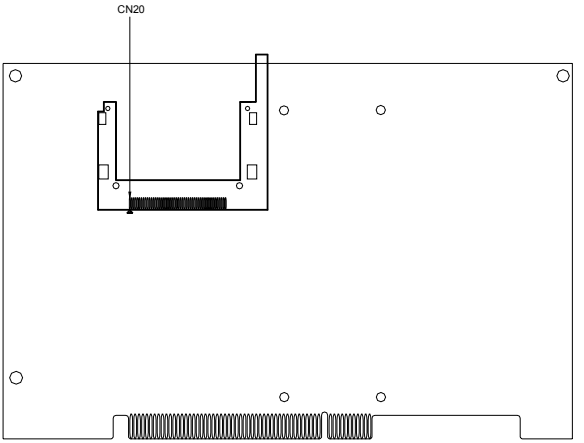
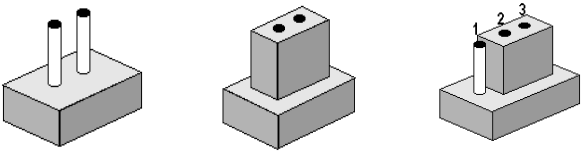


Figure 2.2: Connectors (component side)

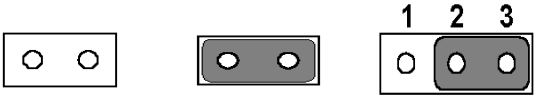
2.5 Setting Jumpers

You may configure your card to match the needs of your application by setting jumpers. A jumper is a metal bridge used to close an electric circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” a jumper, you connect the pins with the clip. To “open” a jumper, you remove the clip. Sometimes a jumper will have three pins, labeled 1, 2 and 3. In this case you would connect either pins 1 and 2, or 2 and 3.



open closed closed 2-3

The jumper settings are schematically depicted in this manual as follows:.



open closed closed 2-3

A pair of needle-nose pliers may be helpful when working with jumpers. If you have any doubts about the best hardware configuration for your application, contact your local distributor or sales representative before you make any changes. Generally, you simply need a standard cable to make most connections.

2.6 Clear CMOS (JP1)

Warning! *To avoid damaging the computer, always turn off the power supply before setting "Clear CMOS." Before turning on the power supply, set the jumper back to "3.0 V Battery On."*

This jumper is used to erase CMOS data and reset system BIOS information.

The procedure for clearing CMOS is:

1. Turn off the system.
2. Short pin 1 and pin 2.
3. Turn on the system. The BIOS is now reset to its default setting

Table 2.3: Clear CMOS (JP1)

Clear CMOS

2.7 COM2 RS-232/422/485 Select (JP2)

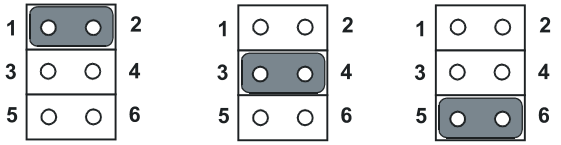


Table 2.4: COM2 RS-232/422/485 Select	
1-2 (default)	RS-232
3-4	RS-422
5-6	RS-485

2.8 PCI_VIO Power Select (JP3)

Table 2.5: PCI_VIO Power Select	
Pin	**Function**
1-2 (default)	+5 V
2-3	+3.3 V

2.9 LVDS Panel Power Select (JP4)

Table 2.6: LVDS Panel Power Select	
Pin	**Function**
1-2 (default)	+5 V
2-3	+3.3 V

2.10 Installing SODIMMs

Notes *The modules can only fit into a socket one way. The gold pins must point down into the SODIMM socket.*

The procedure for installing SODIMMs appears below. Please follow these steps carefully.

1. Make sure that all power supplies to the system are switched off
2. Install the SODIMM card. Install the SODIMM so that its gold pins point down into the SODIMM socket.
3. Slip the SODIMM into the socket at a 45 degree angle and carefully fit the bottom of the card against the connectors.
4. Gently push the SODIMM into a perpendicular position until the clips on the ends of the SODIMM sockets snap into place.
5. Check to ensure that the SODIMM is correctly seated and all connector contacts touch. The SODIMM should not move around in its socket.

2.11 ATX power control Connector (CN5)

The PCI-6881 supports ATX power. CN5 supplies main power (+5 V , +12 V , 5 VSB), and it is a 6 x 2 pins power connector, w/Fixed Lock 4200-WS-A1.

Important *Make sure that the ATX power supply can take at least a 10 mA load on the 5 V standby lead (5 VSB). If not, you may have difficulty powering on your system.*

2.12 Printer port Connector (CN3)

Normally, the printer port is used to connect the card to a printer. The PCI-6881 includes a multi-mode (SPP/EPP/ECP) printer port accessed via CN3 and a 26-pin flat-cable connector. You will need an adapter cable if you use a traditional DB-25 connector. The adapter cable has a 26-pin connector on one end, and a DB-25 connector on the other.

The printer port is designated as LPT1, and can be disabled or changed to LPT2 or LPT3 in the system BIOS setup.

The printer port interrupt channel is designated to be IRQ7.

You can select ECP/EPP DMA channel via BIOS setup.

2.13 CompactFlash Socket

The PCI-6881 provides a 50-pin socket for CompactFlash card type I/II.

2.13.1 CompactFlash (CN20)

The CompactFlash card occupies a secondary IDE channel which can be enabled/disabled via the BIOS settings.

2.14 Floppy Connector (CN2)

You can attach up to two floppy drives to the PCI-6881's on-board controller. You can use any combination of 5.25" (360 KB and 1.2 MB) and/or 3.5" (720 KB, 1.44 MB, and 2.88 MB) drives.

A 34-pin daisy-chain drive connector cable is required for a dual-drive system. On one end of the cable is a 34-pin flat-cable connector. On the other end are two sets of floppy disk drive connectors. Each set consists of a 34-pin flat-cable connector (usually used for 3.5" drives) and a printed-circuit board connector (usually used for 5.25" drives).

2.14.1 Connecting the floppy drive

1. Plug the 34-pin flat-cable connector into CN2. Make sure that the red wire corresponds to pin one on the connector.
2. Attach the appropriate connector on the other end of the cable to the floppy drive(s). You can use only one connector in the set. The set on the end (after the twist in the cable) connects to the A: drive. The set in the middle connects to the B: drive.

3. If you are connecting a 5.25” floppy drive, line up the slot in the printed circuit board with the blocked-off part of the cable connector.

If you are connecting a 3.5” floppy drive, you may have trouble determining which pin is number one. Look for a number printed on the circuit board indicating pin number one. In addition, the connector on the floppy drive may have a slot. When the slot is up, pin number one should be on the right. Check the documentation that came with the drive for more information.

If you desire, connect the B: drive to the connectors in the middle of the cable as described above.

In case you need to make your own cable, you can find the pin assignments for the board’s connector in Appendix B.

2.15 IDE Connector (CN1,CN4)

The PCI-6881 provides two IDE channels to which you can attach up to four Enhanced Integrated Device Electronics hard disk drives or CDROM to the PCI-6881’s internal controller. The PCI-6881's IDE controller uses a PCI interface. This advanced IDE controller supports faster data transfer, PIO Mode 3 or Mode 4, UDMA 33/66/100 mode.

2.15.1 Connecting the hard drive

Connecting drives is done in a daisy-chain fashion. It requires one of two cables (not included in this package), depending on the drive size. 1.8" and 2.5" drives need a 1 x 44-pin to 2 x 44-pin flat-cable connector. 3.5" drives use a 1 x 44-pin to 2 x 40-pin connector.

Wire number 1 on the cable is red or blue, and the other wires are gray.

1. Connect one end of the cable to CN1,CN4. Make sure that the red (or blue) wire corresponds to pin 1 on the connector, which is labeled on the board (on the right side).
2. Plug the other end of the cable into the Enhanced IDE hard drive, with pin 1 on the cable corresponding to pin 1 on the hard drive. (See your hard drive’s documentation for the location of the connector.)

If desired, connect a second drive as described above.

Unlike floppy drives, IDE hard drives can connect to either end of the cable. If you install two drives, you will need to set one as the master and one as the slave by using jumpers on the drives. If you install only one drive, set it as the master.

2.16 VGA/LVDS interface connections

The PCI-6881's display interface can drive conventional CRT displays and is capable of driving a wide range of LVDS flat panel displays as well. The board has two display connectors: one for standard CRT VGA monitors, and one for LVDS flat panel displays.

2.16.1 CRT display Connector (CN10)

CN10 is a standard 15-pin D-SUB connector used for conventional CRT displays. Users can drive a standard progressive scan analog monitor with pixel resolution up to 2048 x 1536 at 75 Hz. Pin assignments for CRT display connector CN10 are detailed in Appendix B.

2.16.2 LVDS LCD panel Connector (CN14)

PCI-6881 uses the Intel 855GME to supports single or dual-channel LVDS panels up to UXGA panel resolution with frequency range from 25MHz to 112MHz.

The display mode can be 2 channels (2 x 18 bits) LVDS LCD panel displays Users can connect to either an 18, 24 or 36 bits LVDS LCD with CN14.

2.16.3 LCD Inverter Power Connector (CN19)

The LCD inverter is connected to CN19 via a 5-pin connector to provide +5 V/+12 V power to the LCD display.

2.17 USB Connectors (CN7,CN8)

The PCI-6881 board provides up to four USB (Universal Serial Bus) ports. This gives complete Plug and Play, and hot attach/detach for up to **127** external devices. The USB interfaces comply with USB specification Rev. 2.0, and are fuse protected.

The USB interface is accessed through the 5 x 2-pin flat-cable connector, CN7 (USB1, 2),CN8 (USB3, 4). You will need an adapter cable if you use a standard USB connector. The adapter cable has a 5 x 2-pin connector on one end and a USB connector on the other.

The USB interfaces can be disabled in the system BIOS setup.

2.18 Ethernet configuration

The PCI-6881 is equipped with a high performance 32-bit PCI-bus Ethernet interface which is fully compliant with IEEE 802.3u 10/100Mbps

CSMA/CD standards. It is supported by all major network operating systems.

The PCI-6881 supports 10/100Base-T or 1000Base-T Ethernet connections with onboard RJ-45 connectors (CN11). PCI-6881F series supports 10/100Base-T LAN, PCI-6881FG series supports 1000Base-T LAN.

2.18.1 LAN Connector (CN11)

10/100Base-T or 1000Base-T connects to the PCI-6881 via a cable to a standard RJ-45 connector.

2.18.2 Network boot

The Network Boot feature can be utilized by incorporating the Boot ROM image files for the appropriate network operating system. The Boot ROM BIOS files are included in the system BIOS, which is on the utility CD disc.

2.19 HDD LED/Reset/Power Button (CN9)

Next, you may want to install external switches to monitor and control the PCI-6881. These features are optional: install them only if you need them. CN9 is an 2x5 pin header, 180 degree, male. It provides connections for reset and power & hard disk indicator.

2.19.1 Reset (Pin7&Pin8)

If you install a reset switch, it should be an open single pole switch. Momentarily pressing the switch will activate a reset. The switch should be rated for 10 mA, 5 V.

2.19.2 HDD LED (Pin1&Pin2,Pin3&Pin4,Pin5&Pin6)

The HDD LED indicator for hard disk access is an active low signal (24 mA sink rate).

Pin3&Pin4

The HDD LED indicator would light when the power is on.

Pin5&Pin6

The HDD LED indicator would light when the computer is suspend.

2.19.3 Power Button (Pin9&Pin10)

PCI-6881 also supports power on/off button.

2.20 COM port Connector (CN6,CN12,CN13)

The PCI-6881 provides four COM ports (COM1,COM3,COM4: RS-232 and COM2: RS-232/422/485). CN12 supports COM1, CN13 supports COM2, CN6 supports COM3, COM4. And JP2 is for COM2 RS-232/ 422/485 selection. It provides connections for serial devices (a mouse, etc.) or a communication network. You can find the pin assignments for the COM port connector in Appendix B.

2.21 MINI Keyboard Connector (CN17)

The PCI-6881 board provides a keyboard connector that supports both a keyboard and a PS/2 style mouse. In most cases, especially in embedded applications, a keyboard is not used. If the keyboard is not present, the standard PC/AT BIOS will report an error or fail during power-on self-test (POST) after a reset. The PCI-6881's BIOS standard setup menu allows you to select "All, But Keyboard"under the "Halt On"selection. This allows no-keyboard operation in embedded system applications, without the system halting under POST.

2.22 External Keyboard Connector (CN18)

In addition to the Mini keyboard connector on the PCI-6881's rear plate, there is an additional onboard external keyboard connector, allowing for greater flexibility in system design.

2.23 Audio Interface Connector (CN15)

The Audio Interface link is a 10 pin connector, the PCI-6881 can support Audio with the addition of optional PCM-231A-00A1. Detailed pin assignment refer to Appendix B.

2.24 DI/O Connector (CN16)

The PCI-6881 supports DI/O interface by CN16, which is a 7 x 2 dual line pin header, supply 8-bit general purpose input or output ports.

CHAPTER 3

Software Configuration

This chapter details the software configuration information. It shows you how to configure the card to match your application requirements. Award System BIOS will be covered in Chapter 4.

Sections include:

- Introduction
- VGA display software configuration

Chapter 3 Software Configuration

3.1 Introduction

The system BIOS and custom drivers are located in a 512 KB, 32-pin (JEDEC spec.) Flash ROM device, designated U15. A single Flash chip holds the system BIOS, VGA BIOS, and network Boot ROM image. The display can be configured via software. This method minimizes the number of chips and eases configuration. You can change the display BIOS simply by reprogramming the Flash chip.

3.2 VGA display firmware configuration

The onboard VGA interface supports a wide range of popular LCD, EL, gas plasma flat panel displays and traditional analog CRT monitors. The 855GME chip with optimized Shared Memory Architecture, supports up to 32 MB frame buffer using system memory to provide LVDS mode up to UXGA panel resolution with frequency range from 25 MHz to 112 MHz, the interface can drive CRT displays with resolutions up to 2048 x 1536 @ 75 Hz.

The VGA interface is configured completely via the software utility, so you do not have to set any jumpers. Configure the VGA display as follows:

1. Apply power to the board with a color TFT display attached. This is the default setting for this board. Ensure that the AWDFLASH.EXE and *.BIN files are located in the working drive.

NOTE: Ensure that you do not run AWDFLASH.EXE while your system is operating in EMM386 mode.

2. At the prompt, type AWDFLASH.EXE and press <Enter>. The VGA configuration program will then display the following:

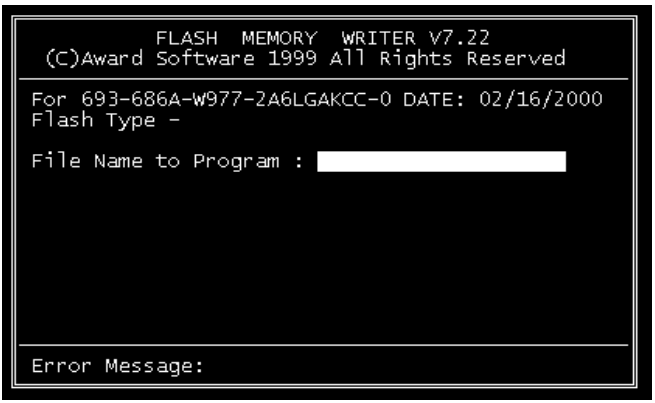


Figure 3.1: VGA setup screen

3. At the prompt, enter the new BIN file which supports your display. When you are sure that you have entered the file name correctly press <Enter>.
4. The screen will ask “do you want to save the BIOS?” If you change your mind or have made a mistake, press N to abort and end the setup procedure. Press Y if you wish to save the existing configuration before changing it. Then type the name under which you want to save the current configuration.
5. The prompt will then ask “Are you sure to program?” Press Y if you want the new file to be written into the BIOS. Press N to exit the program.

The new VGA configuration will then write to the ROM BIOS chip. This configuration will remain the same until you run the AWDFLASH.EXE program and change the settings.

3.3 Connectors to Standard LCDs

The following table illustrate typical LCD connection pinouts for the PCI-6881.

3.3.1 AU M170EG01(1280 x1024 LVDS LCD)

Table 3.1: Connections to LCD/Flat Panel (CN14)

LCD Connector		Flat Panel Connector	
JAE FI-X30C2L		DF13-40P	
Pin	**Signal**	**Pin**	**Signal**
1	RxOIN0-	7	OD0-
2	RxOIN0+	9	OD0+
3	RxOIN1-	13	OD1-
4	RxOIN1+	15	OD1+
5	RxOIN2-	19	OD2-
6	RxOIN2+	21	OD2+
7	VSS	23	GND
8	RxOCLKIN-	25	OCK-
9	RxOCLKIN+	27	OCK+
10	RxOIN3-	35	OD3-
11	RxOIN3+	37	OD3+
12	RxEIN0-	8	ED0-
13	RxEIN0+	10	ED0+
14	VSS	4	WP#
15	RxEIN1-	14	ED1-
16	RxEIN1+	16	ED1+
17	VSS	12	GND
18	RxEIN2-	20	ED2-
19	RxEIN2+	22	ED2+
20	RxECLKIN-	26	ECK-
21	RxECLKIN+	28	ECK+
22	RxEIN3-	36	ED3-
23	RxEIN3+	38	ED3+
24	VSS	34	GND
25	VSS	30	GND
26	NC	X	
27	VSS	34	GND
28	VCC	1	VDDSAFE
29	VCC	2	VDDSAFE

CHAPTER 4

Award BIOS Setup

This chapter describes how to set BIOS configuration data.

Chapter 4 Award BIOS Setup

4.1 System test and initialization

These routines test and initialize board hardware. If the routines encounter an error during the tests, you will either hear a few short beeps or see an error message on the screen. There are two kinds of errors: fatal and non-fatal. The system can usually continue the boot up sequence with non-fatal errors. Non-fatal error messages usually appear on the screen along with the following instructions:

```
press <F1> to RESUME
```

Write down the message and press the F1 key to continue the bootup sequence.

4.1.1 System configuration verification

These routines check the current system configuration against the values stored in the board's CMOS memory. If they do not match, the program outputs an error message. You will then need to run the BIOS setup program to set the configuration information in memory.

There are three situations in which you will need to change the CMOS settings:

1. You are starting your system for the first time
2. You have changed the hardware attached to your system
3. The CMOS memory has lost power and the configuration information has been erased.

The PCI-6881 Series' CMOS memory has an integral lithium battery backup. The battery backup should at least three years in normal service, but when it finally runs down, you will need to replace the complete unit.

4.2 Award BIOS setup

Award's BIOS ROM has a built-in Setup program that allows users to modify the basic system configuration. This type of information is stored in battery-backed CMOS RAM so that it retains the Setup information when the power is turned off.

4.2.1 Entering setup

Power on the computer and press <Del> immediately. This will allow you to enter Setup.

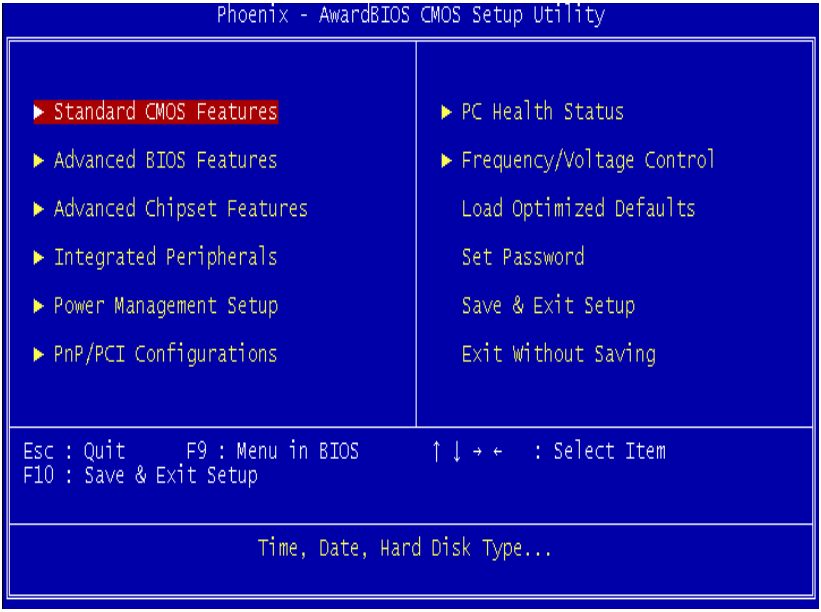


Figure 4.1: BIOS setup program initial screen

4.2.2 Standard CMOS Features setup

When you choose the Standard CMOS Features option from the Initial Setup Screen menu, the screen shown below is displayed. This standard Setup Menu allows users to configure system components such as date, time, hard disk drive, floppy drive and display. Once a field is highlighted, on-line help information is displayed in the left bottom of the Menu screen.

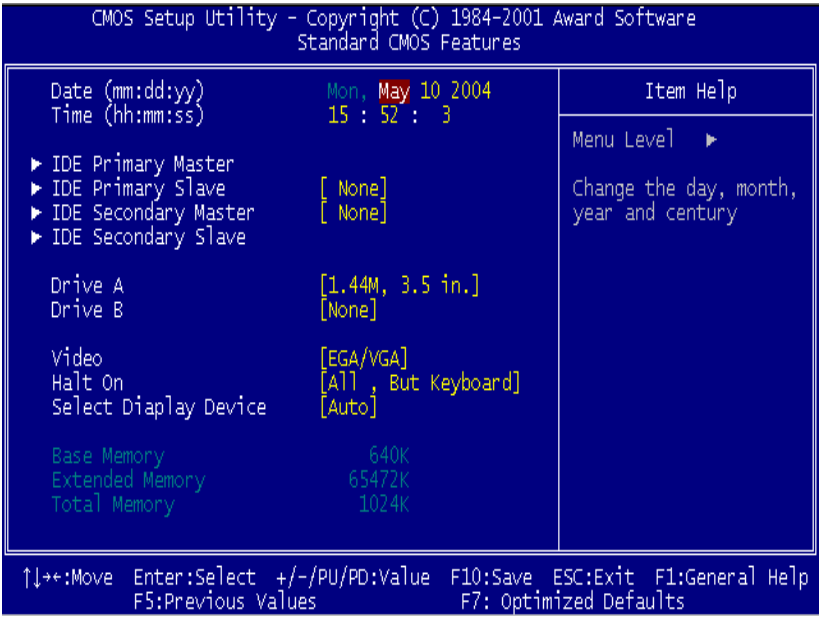


Figure 4.2: CMOS Features setup

4.2.3 Advanced BIOS Features setup

By choosing the Advanced BIOS Features Setup option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6881 Series.

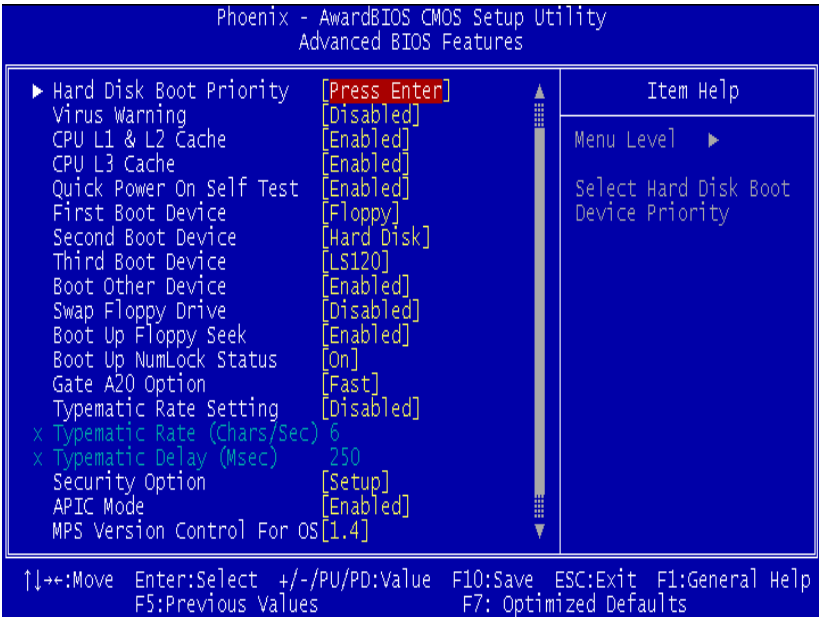


Figure 4.3: Advanced BIOS Features setup

4.2.4 Advanced Chipset Features setup

By choosing the Advanced Chipset Features option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6881 Series.

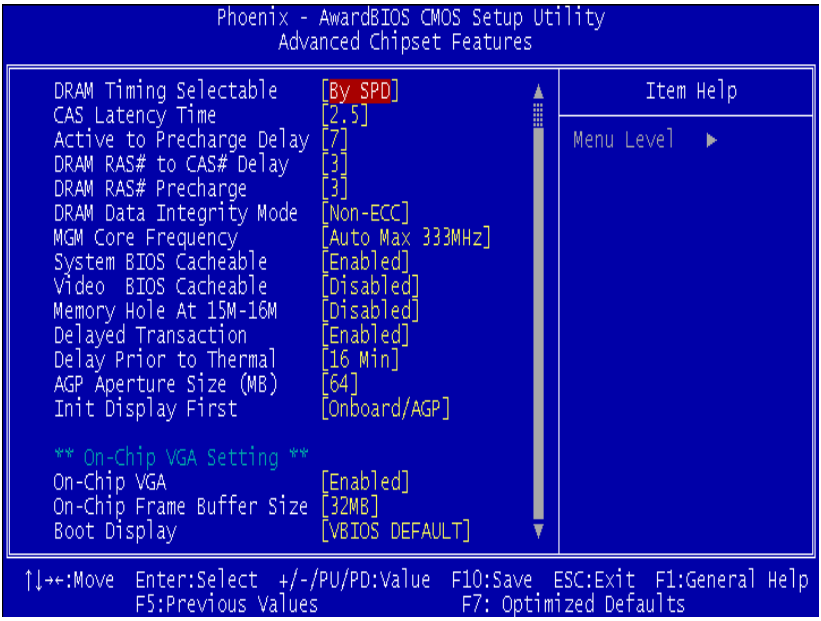


Figure 4.4: Advanced Chipset Features setup

4.2.5 Integrated Peripherals

Choosing the Integrated Peripherals option from the Initial Setup Screen menu should produce the screen below. Here we see the manufacturer's default values for the PCI-6881 Series.

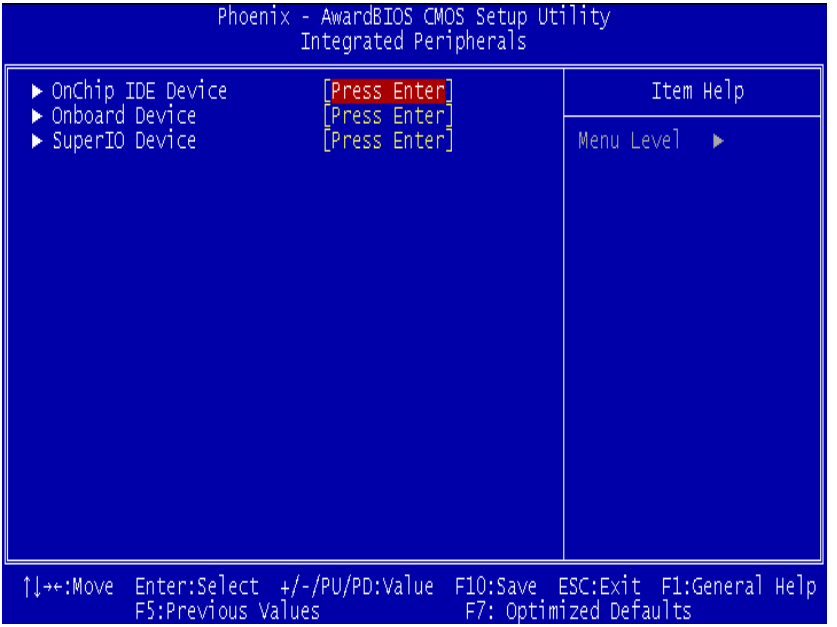


Figure 4.5: Integrated Peripherals

4.2.6 Power Management Setup

By choosing the Power Management Setup option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6881 Series.

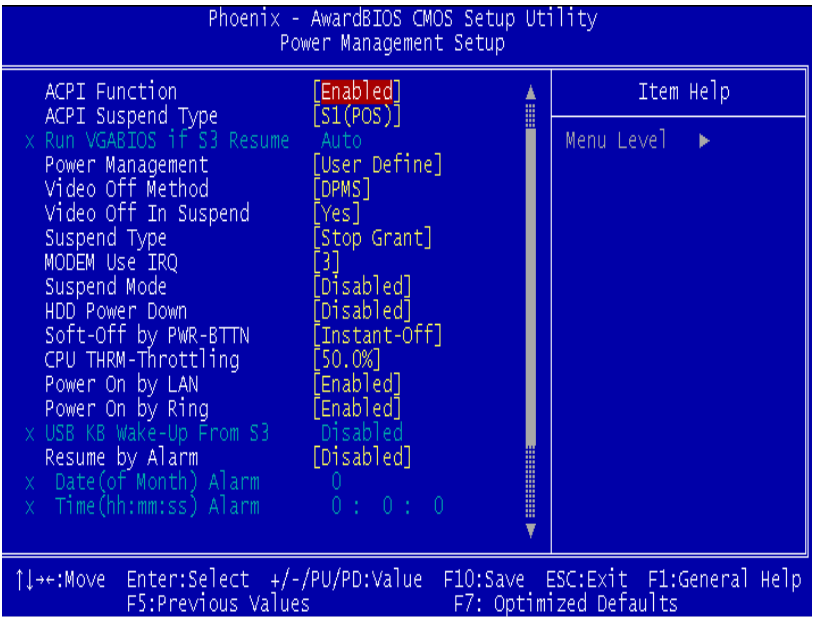


Figure 4.6: Power Management Setup

4.2.7 PnP/PCI Configurations

By choosing the PnP/PCI Configurations option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6881 Series.

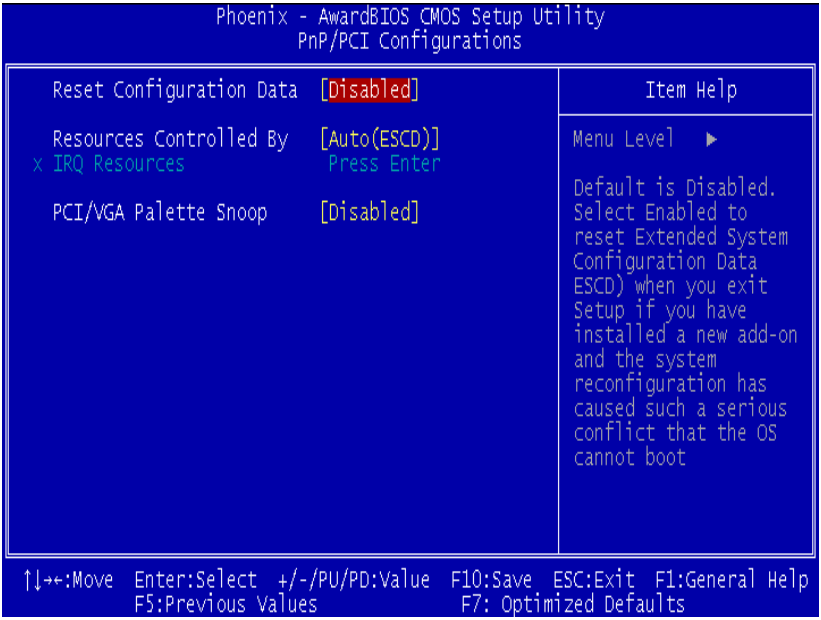


Figure 4.7: PnP/PCI Configurations

4.2.8 PC Health Status

The PC Health Status option displays information such as CPU and motherboard temperatures, fan speeds, and core voltage.

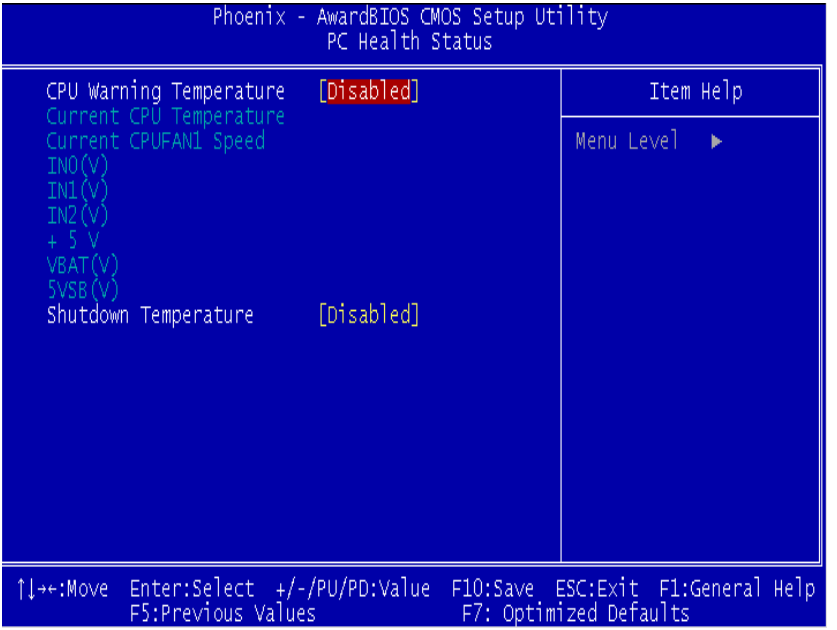


Figure 4.8: PC Health Status

4.2.9 Frequency/Voltage Control

By choosing the Frequency/Voltage Control option from the Initial Setup Screen menu, the screen below is displayed. This sample screen contains the manufacturer's default values for the PCI-6881.

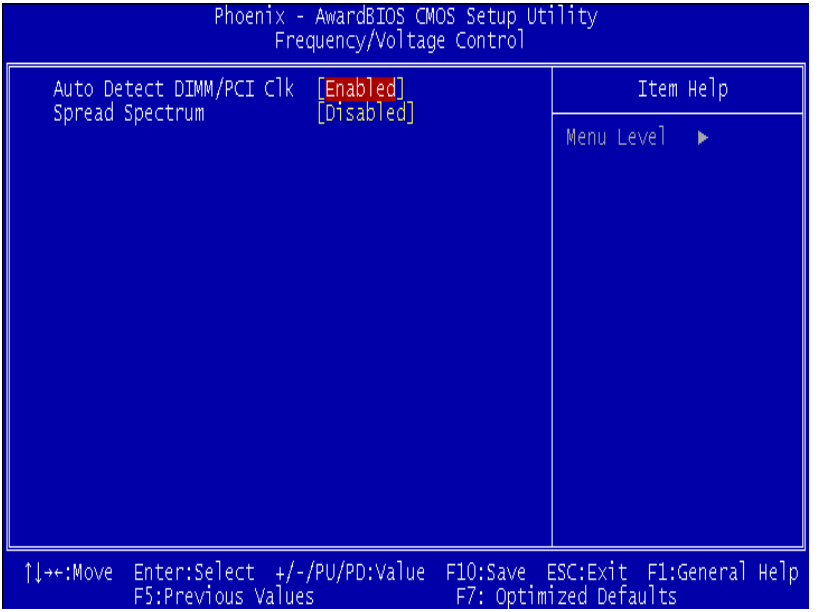


Figure 4.9: Frequency/Voltage Control

Caution *Incorrect settings in Frequency/Voltage Control may damage the system CPU, video adapter, or other hardware.*

4.2.10 Load Optimized Defaults

Load Optimized Defaults loads the default system values directly from ROM. If the stored record created by the Setup program should ever become corrupted (and therefore unusable), these defaults will load automatically when you turn the PCI-6881 Series system on.

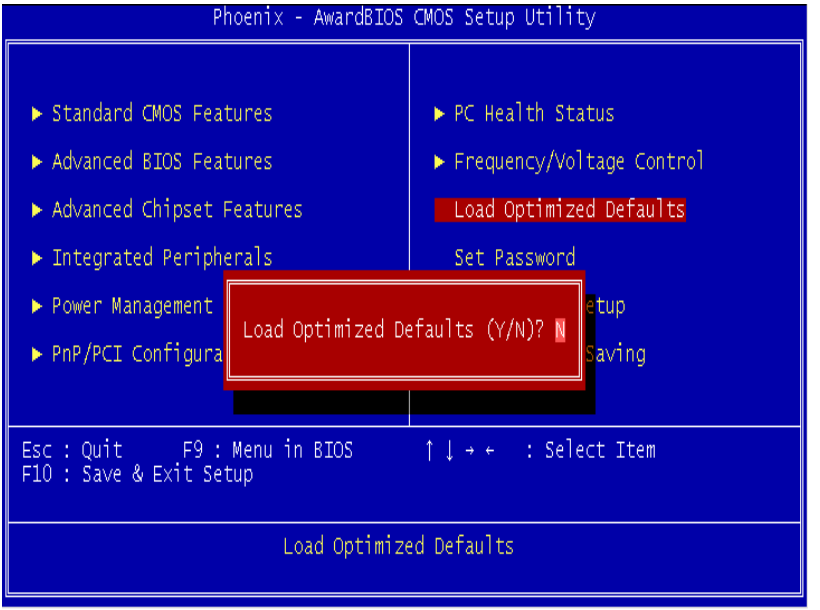


Figure 4.10: Load BIOS defaults screen

4.2.11 Set Password

Note *To enable this feature, you should first go to the Advanced BIOS Features menu, choose the Security Option, and select either Setup or System, depending on which aspect you want password protected. Setup requires a password only to enter Setup. System requires the password either to enter Setup or to boot the system.*

A password may be at most 8 characters long.

To Establish Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password,” enter the desired password and press <Enter>.
3. At the “Confirm Password” prompt, retype the desired password, then press <Enter>.
4. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

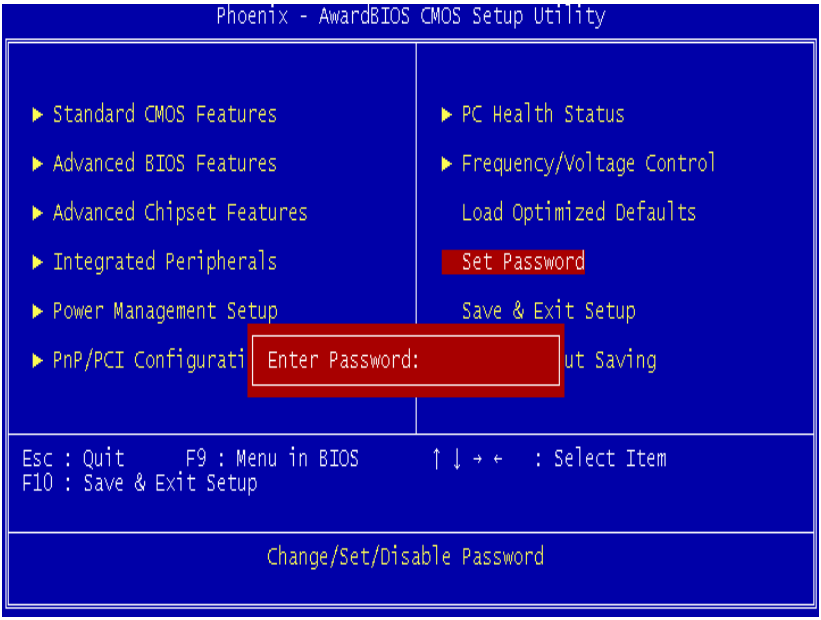


Figure 4.11: Set password

To Change Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password,” enter the existing password and press <Enter>.
3. You will see “Confirm Password.” Type it again, and press <Enter>.

4. Select Set Password again, and at the “Enter Password” prompt, enter the new password and press <Enter>.
5. At the “Confirm Password” prompt, retype the new password, and press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

To Disable Password

1. Choose the Set Password option from the CMOS Setup Utility main menu and press <Enter>.
2. When you see “Enter Password,” enter the existing password and press <Enter>.
3. You will see “Confirm Password.” Type it again, and press <Enter>.
4. Select Set Password again, and at the “Enter Password” prompt, don’t enter anything; just press <Enter>.
5. At the “Confirm Password” prompt, again don’t type in anything; just press <Enter>.
6. Select Save to CMOS and EXIT, type <Y>, then <Enter>.

4.2.12 Save & Exit Setup

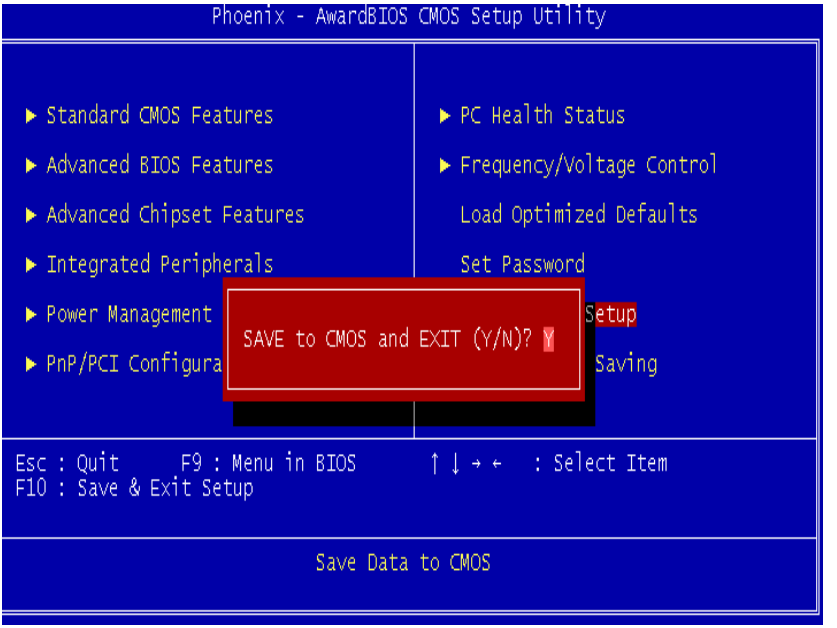


Figure 4.12: Save to CMOS and EXIT

If you select this option and press <Y> then <Enter>, the values entered in the setup utilities will be recorded in the chipset's CMOS memory. The microprocessor will check this every time you turn your system on and use the settings to configure the system. This record is required for the system to operate.

4.2.13 Exit Without Saving

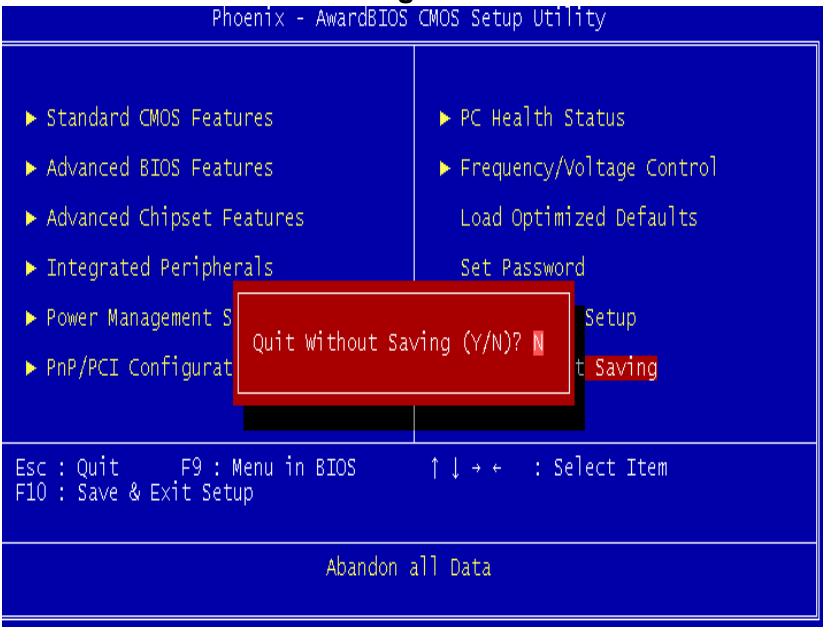


Figure 4.13: Quit without saving

Selecting this option and pressing <Enter> lets you exit the Setup program without recording any new values or changing old ones.

CHAPTER 5

PCI SVGA Setup

Introduction

Installation of SVGA drivers

-for Windows 95/98/Me

-for Windows NT/2000/XP

Further information

Chapter 5 PCI SVGA Setup

5.1 Introduction

The board has an onboard interface. The specifications and features are described as follows:

5.1.1 Chipset

The PCI-6881 uses a Intel 855GME + ICH4 chipset for its graphic controller. It supports LVDS LCD displays, conventional CRT monitors.

5.1.2 Display memory

The 855GME chip with optimized Shared Memory Architecture, supports up to 32 MB frame buffer using system memory to provide LVDS mode up to 1280 x 1024 @ 36bpp with frequency range from 25 MHz to 112 MHz. the interface can drive CRT displays with resolutions up to 2048 x 1536 @ 75 Hz.

5.1.3 Display types

CRT and panel displays can be used simultaneously. The board can be set in one of three configurations: on a CRT, on a flat panel display, or on both simultaneously. The system is initially set to simultaneous display mode. If you want to enable the CRT display only or the flat panel display only, please contact VIA Technology Inc., or our sales representative for detailed information.

5.2 Installation of the SVGA Driver

Complete the following steps to install the SVGA driver. Follow the procedures in the flow chart that apply to the operating system that you are using within your board.

Notes:

1. The windows illustrations in this chapter are intended as examples only. Please follow the listed steps, and pay attention to the instructions which appear on your screen.

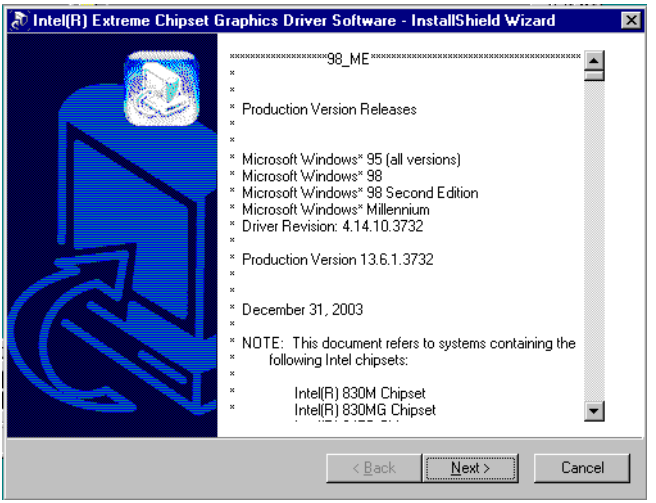
2. For convenience, the CD-ROM drive is designated as "D" throughout this chapter.

5.2.1 Installation for Windows 98/ME

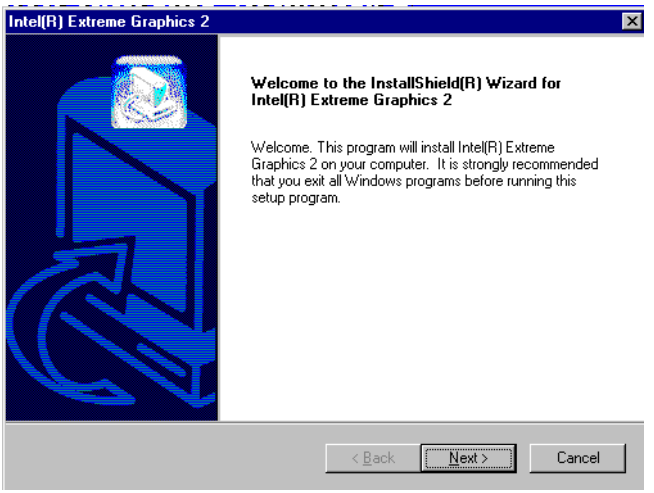
To install SVGA driver for Window 95/98, please run the setup wizard "Intel Extreme Graphic 2" in CD-ROM. Example of installation is shown as bellow:

1. Select the path: D:\2_VGA, then double click "win9x1361" to run "Install Shield Wizard"

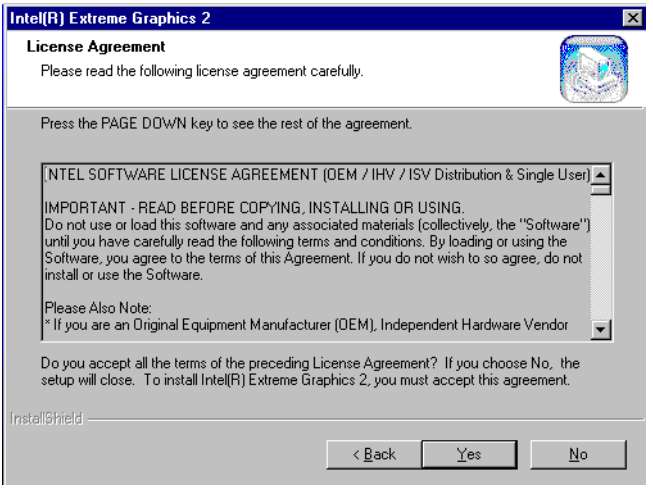
2. Press the "Next" button



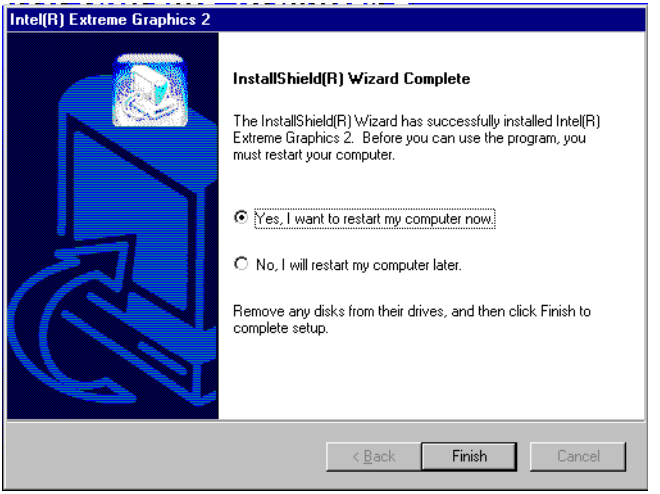
3. Press the "Next" button



4. In order to install Intel® Extreme Graphics 2, you must accept the agreement, and press the "Yes" button



5. Choose the option "Yes, I want to restart my computer now", then press the "Finish" button

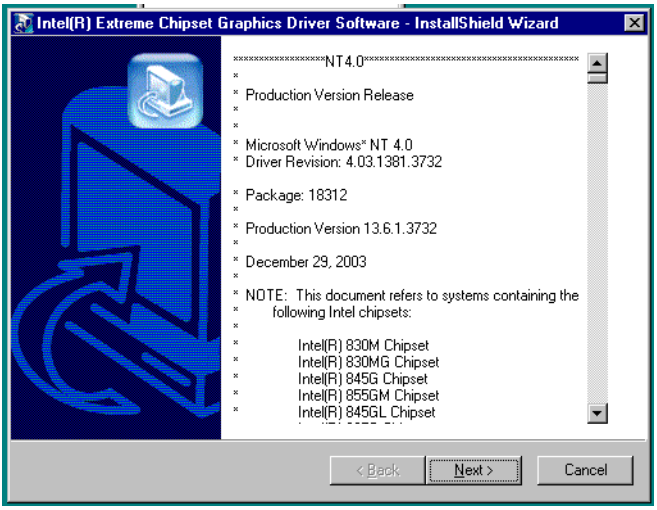


5.2.2 Installation for Windows NT

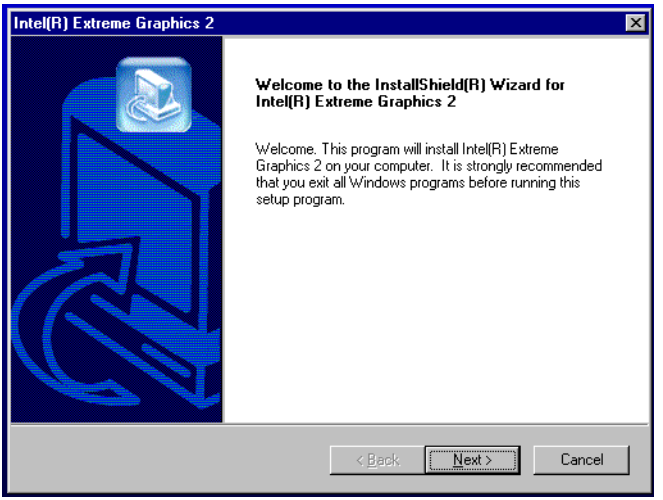
Note: *Service Pack X (X = 3, 4, 5, 6,...) must be installed first, before you install the Windows NT VGA driver.*

To install SVGA driver for Window NT, please run the setup wizard "Intel Extreme Graphic 2" in CD-ROM. Example of installation is shown as bellow:

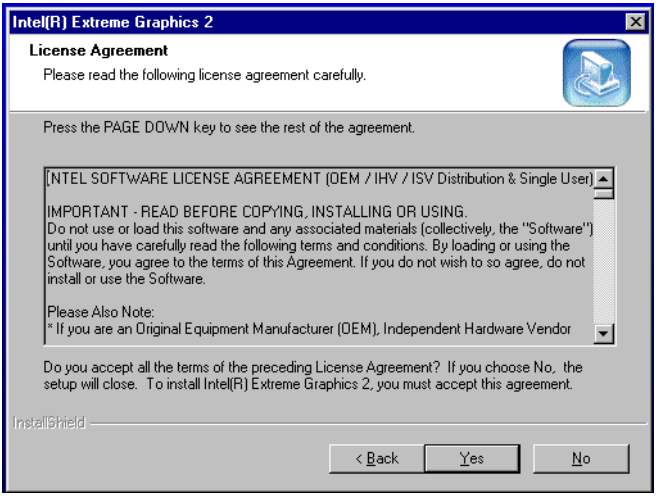
1. Select the path: D:\2_VGA, then double click "winnt41361" to run "Install Shield Wizard", and press “Next” button.

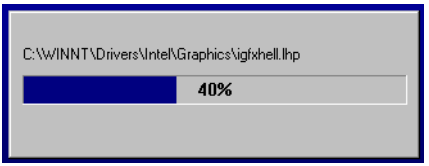


2. Press the "Next" button

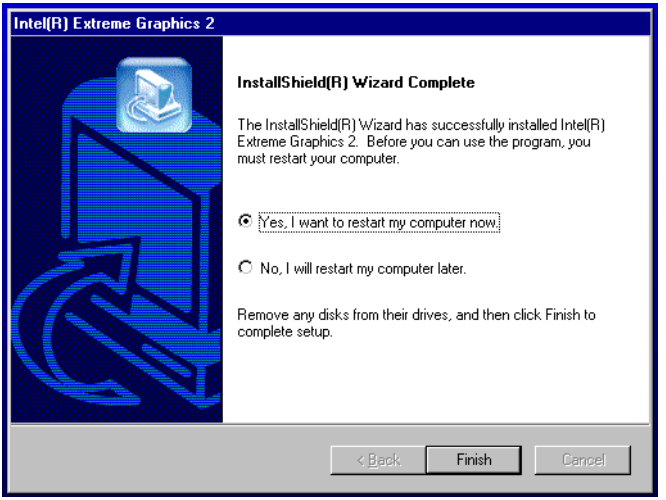


3. In order to install Intel® Extreme Graphics 2, you must accept the agreement, press the "Yes" button and wait a minute.





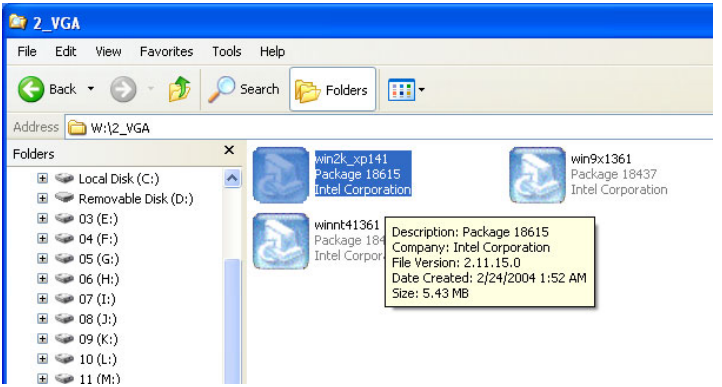
4. Choose the option "Yes, I want to restart my computer now", then press the "Finish" button.



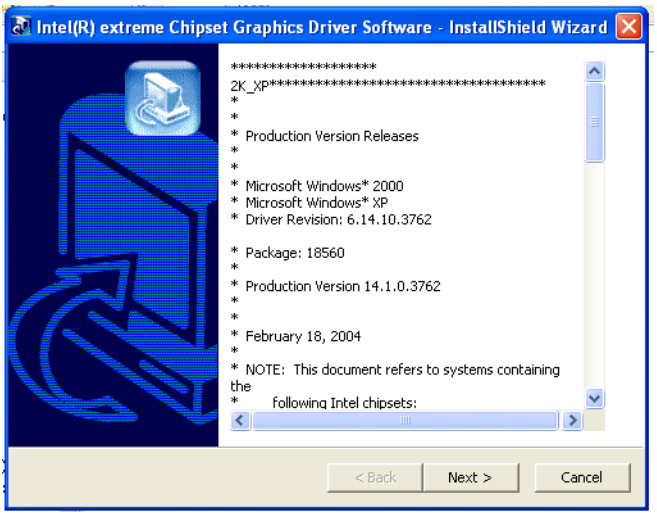
5.2.3 Installation for Windows 2000/XP

To install SVGA driver for Window 2000/XP, please run the setup wizard "Intel Extreme Graphic 2" in CD-ROM. Example of installation is shown as bellow:

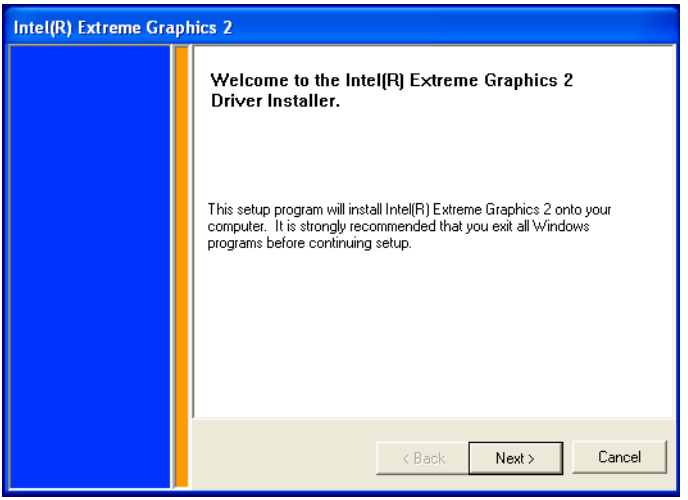
1. Select the path: W:\2_VGA, then double click "win2k_xp149" to run "Install Shield Wizard"



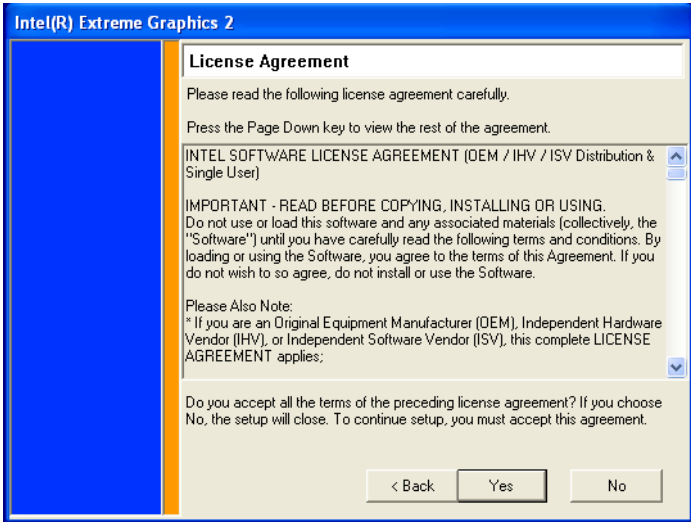
2. Press the "Next" button.

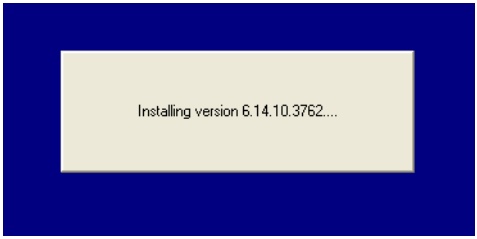


3. Press the "Next" button.

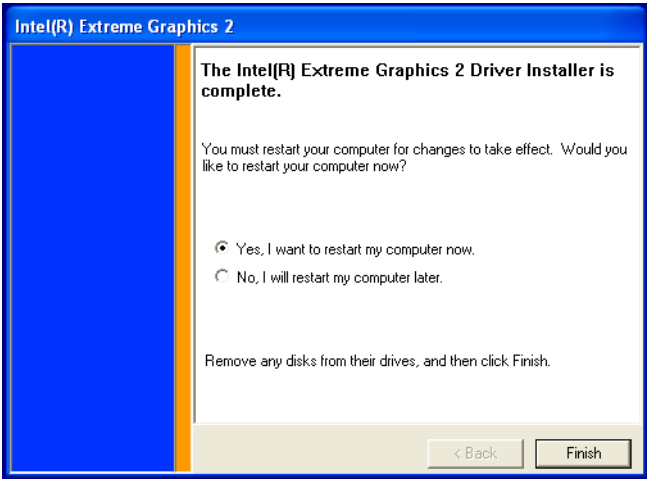


4. In order to continue setup, you must accept the agreement, press the "Yes" button and wait a minute.





5. Choose the option "Yes, I want to restart my computer now." and press the "Finish" button.



5.3 Further Information

For further information about the AGP/VGA installation in your PCA-6881, including driver updates, troubleshooting guides and FAQ lists, visit the following web resources:

VIA website: www.via.com.tw

Advantech websites: www.advantech.com
www.advantech.com.tw

CHAPTER 6

PCI Bus Ethernet Interface

This chapter provides information on Ethernet configuration.

- Introduction
- Installation of Ethernet drivers for Windows 98/2000/NT
- Further information

Chapter 6 PCI Bus Ethernet Interface

6.1 Introduction

The board is equipped with a high performance 32-bit Ethernet chipset which is fully compliant with 802.3u 100Base-T or 802.3z/ab 1000Base-T. It is supported by major network operating systems. It is also both 100Base-T and 10Base-T compatible.

The Ethernet port provides a standard RJ-45 jack. The network boot feature can be utilized by incorporating the boot ROM image files for the appropriate network operating system. The boot ROM BIOS files are combined with system BIOS, which can be enabled/disabled in the BIOS setup.

6.2 Installation of Ethernet driver

Before installing the Ethernet driver, note the procedures below. You must know which operating system you are using in your board Series, and then refer to the corresponding installation flow chart. Then just follow the steps described in the flow chart to quickly complete the installation.

Note: The windows illustrations in this chapter are examples only. Follow the steps and pay attention to the instructions which appear on your screen.

6.2.1 Installation for MS-DOS and Windows 3.1

If you want to set up your Ethernet connection under the MS-DOS or Windows 3.1 environment, you should first check your server system model. For example, MS-NT, IBM-LAN server, and so on.

Then choose the correct driver to install in your biscuit PC.

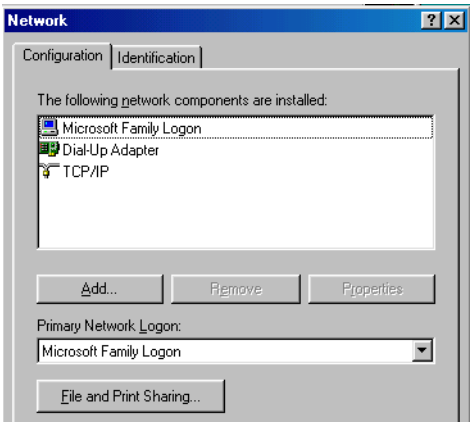
The installation procedures for various servers can be found on the supplied CD-ROM, the correct path being:

D:\LAN\82551ER\W9xW2k

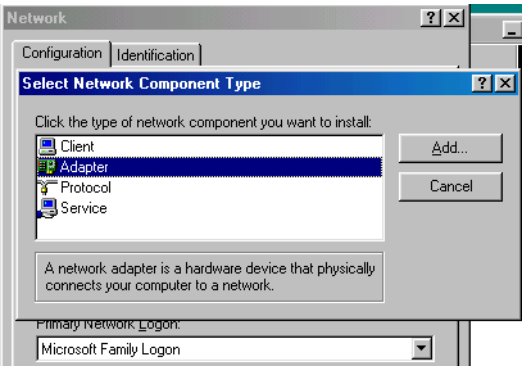
6.2.2 Installation for Windows 98/Me

1. a. Select "Start", "Settings". "Control Panel".
   b. Double click "Network".

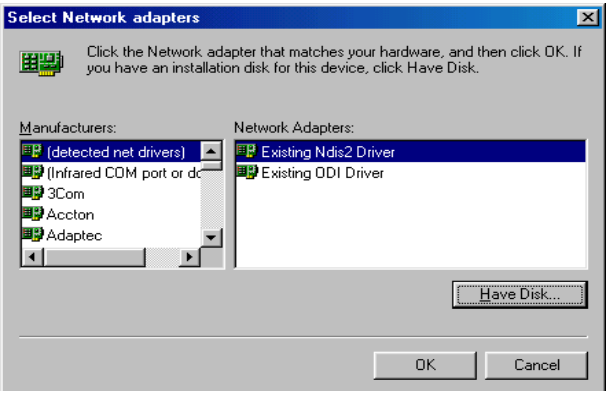
2. a. Click "Add" and prepare to install network functions.



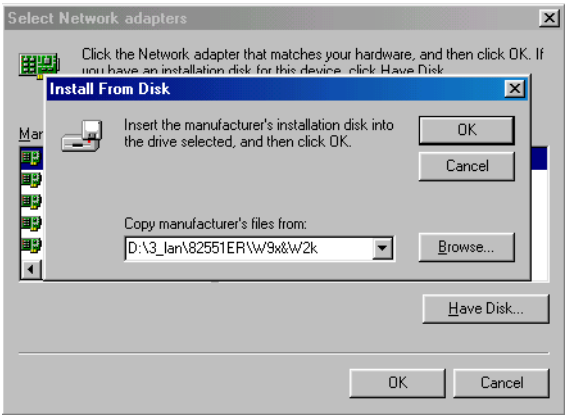
3. a. Select the "Adapter" item to add the Ethernet card.



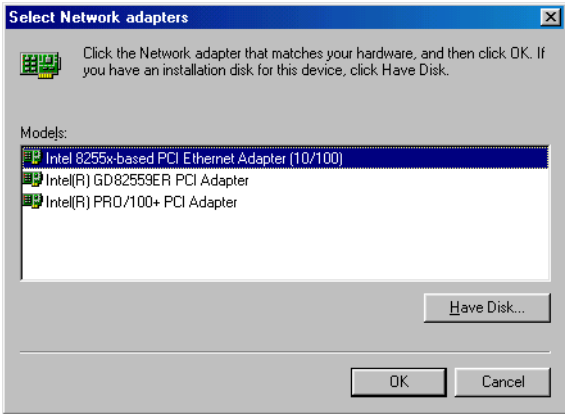
4. a. Click "Have Disk" to install the driver.



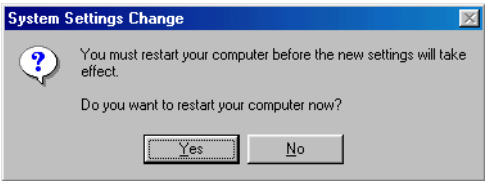
5. a. Insert the CD into the D: drive
   b. Fill in "D:\3_lan\82551ER\W9xW2k"
   c. Click "OK"



6. a. Choose the " Intel 8255x based PCI Ethernet Adapter (10/100)"
   b. Click "OK".

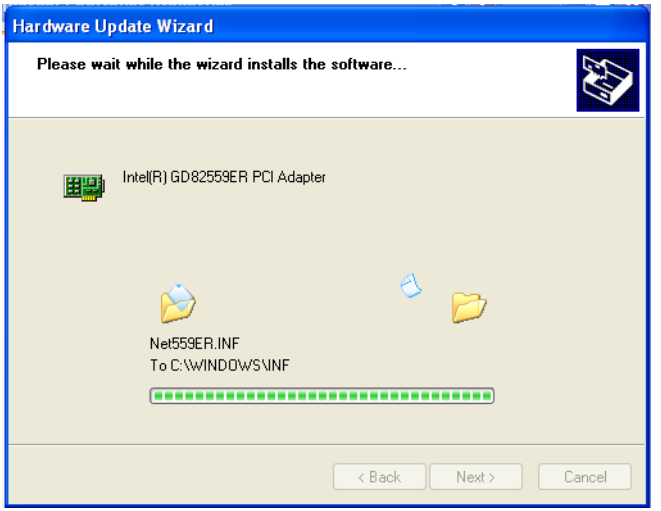


7. a. Make sure the configurations of relative items are set correctly.
   b. Click "Yes" to reboot.

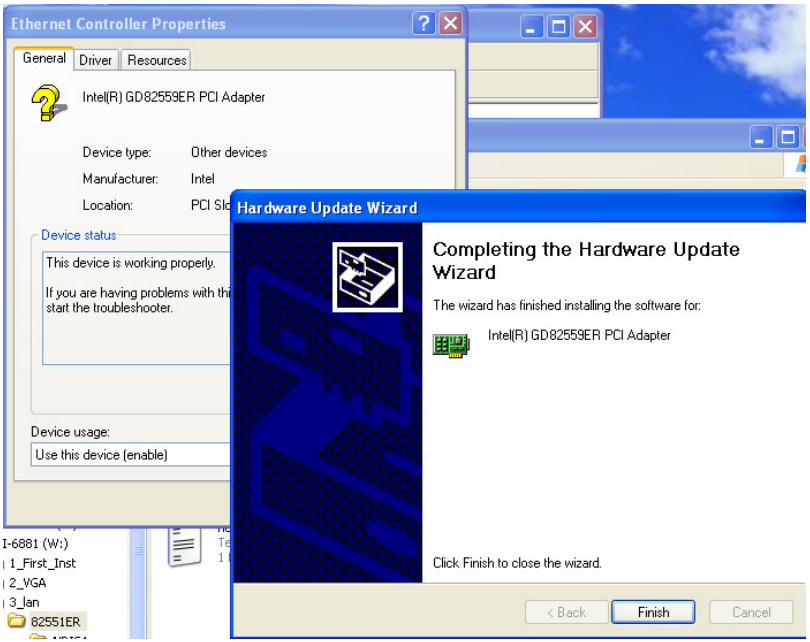


6.2.3 Installation for Windows XP

1. Please wait for a moment.



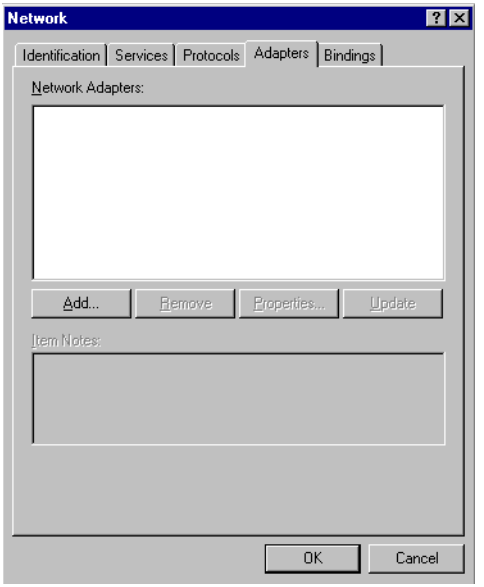
2. Click the "Finish" button



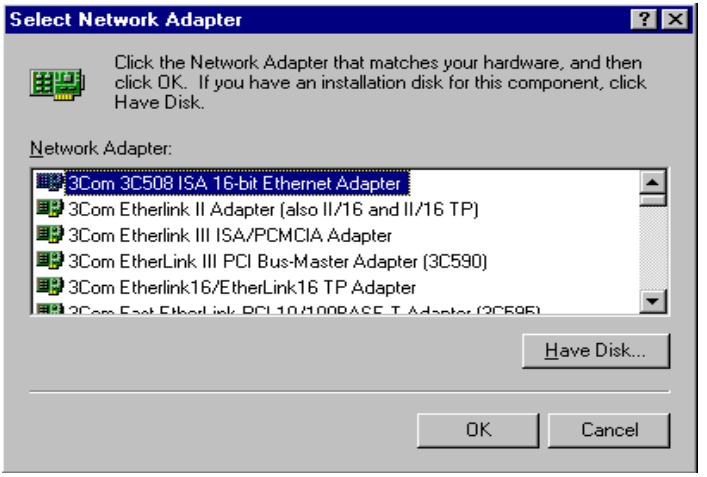
6.2.4 Installation for Windows NT

1. a. Select "Start", "Settings", "Control Panel"
   b. Double click "Network"

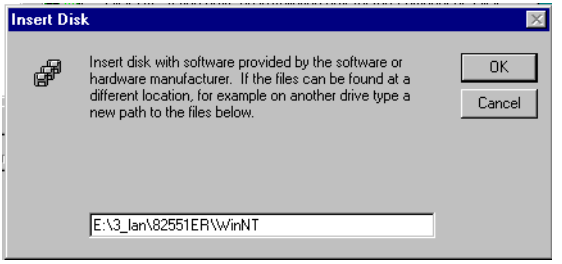
2. Click “Add”.



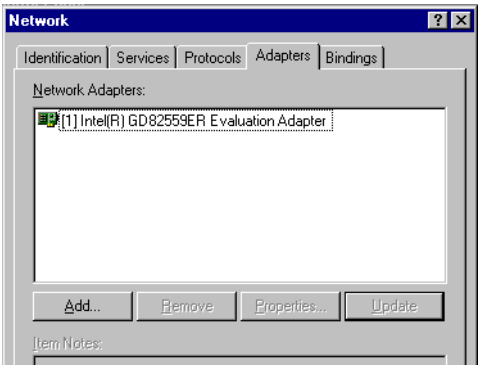
3. Click “Have Disk.”



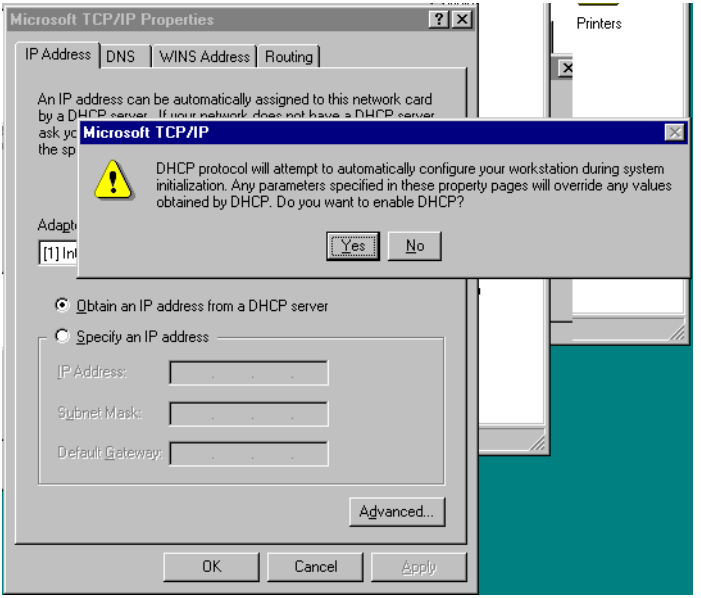
4. a. Insert the Utility CD ROM
   b. Fill in the correct path: E:\3_lan\82551ER\WinNT
   c. Click "OK".



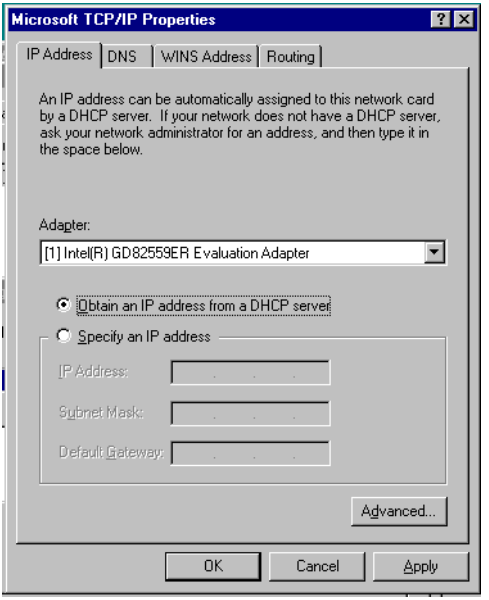
5. Check the highlighted item, and click “OK.”



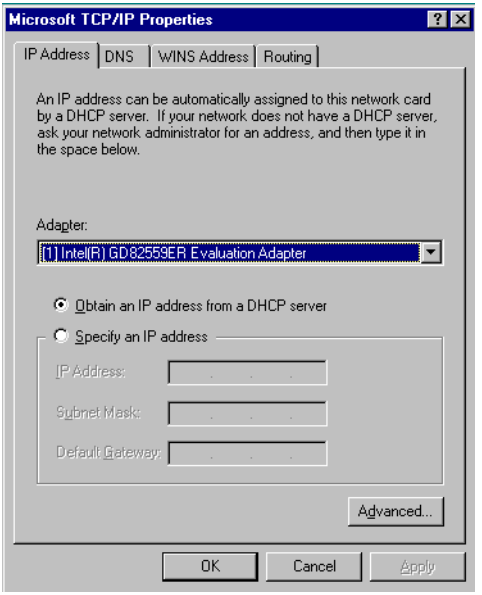
6. Click “Yes”.


Printers
Microsoft TCP/IP Properties
IP Address
DNS
WINS Address
Routing
An IP address can be automatically assigned to this network card
Microsoft TCP/IP
DHCP protocol will attempt to automatically configure your workstation during system initialization. Any parameters specified in these property pages will override any values obtained by DHCP. Do you want to enable DHCP?
Yes
No
Obtain an IP address from a DHCP server
Specify an IP address
IP Address:
Subnet Mask:
Default Gateway:
Advanced...
OK
Cancel
Apply

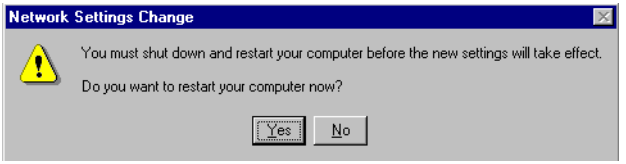
7. a. Choose Adapter option "[1] Intel® GD82559ER Evaluation Adapter"
   b. Click " Obtain an IP address from a DHCP server



8. Click "Apply"



9. Click “Yes” to reboot your computer.



CHAPTER 7

Audio Setup

- Introduction
- Installation of audio driver for Windows 98
- Installation of audio driver for Windows XP

Chapter 7 Audio Setup

7.1 Introduction

The PCI-6881 supports AC97 audio through the optional audio module PCM-231A-00A1.

Notes *The audio function needs external AUDIO board*

e.g. PCM-231.

7.2 Driver installation

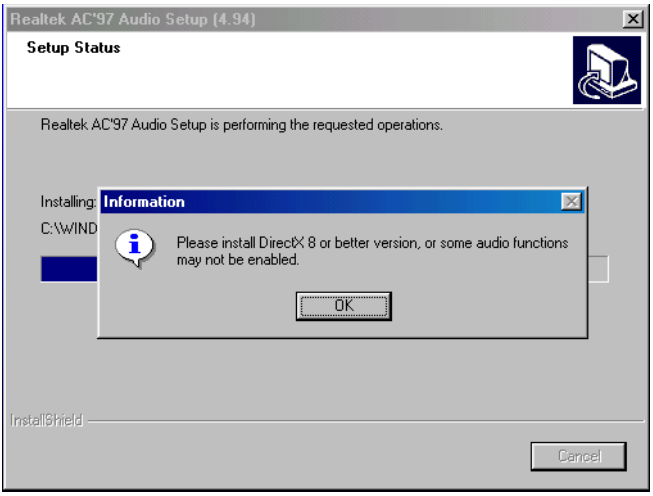
7.2.1 Before you begin

Please read the instructions in this chapter carefully before you attempt installation. The audio drivers for the PCI-6881 board are located on the audio driver CD. Run the supplied SETUP program to install the drivers; don't copy the files manually.

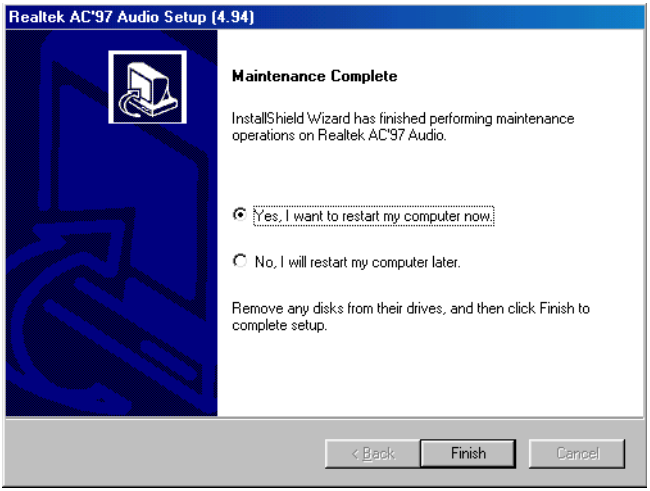
Note: The files on the software installation diskette are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.

7.2.2 Windows 98 driver

1. Press the "OK" button



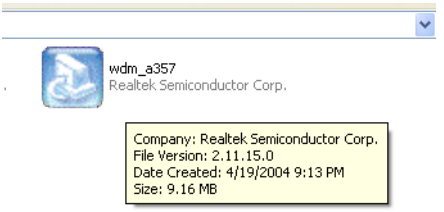
2. Choose the option "Yes, I want to restart my computer now", press the "Finish" button to reboot your computer



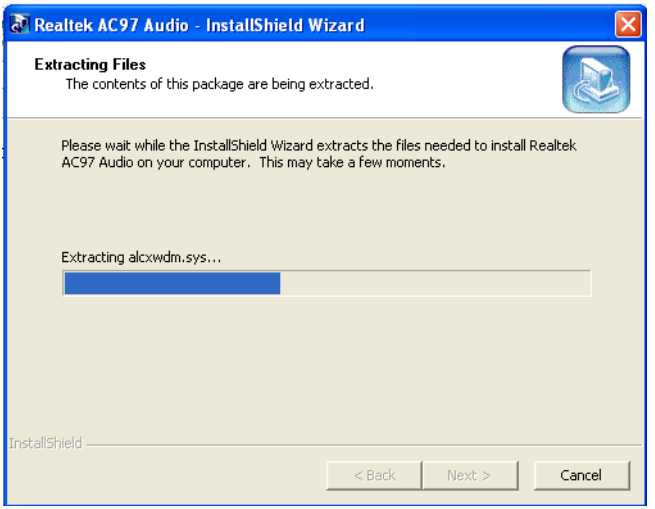
7.2.3 Windows XP driver

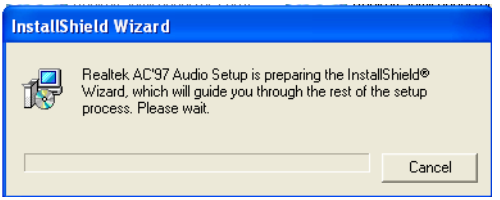
To install audio driver for Window XP, please run the setup wizard in CD-ROM. Example of installation is shown as bellow:

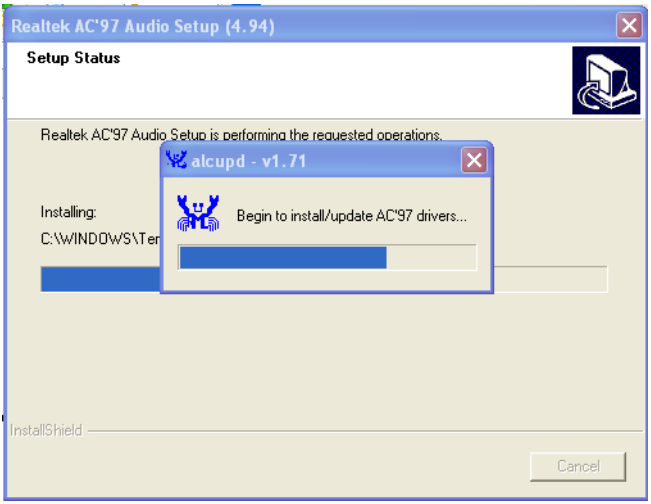
1. Select the path: D:\wdm_a357, then double click to run "Install Shield Wizard"



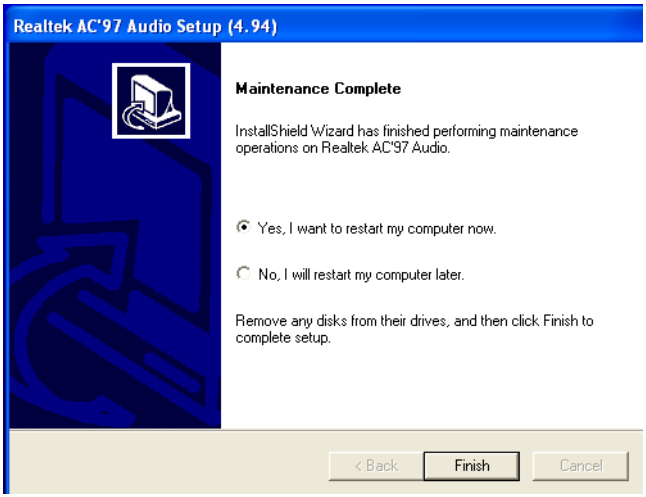
2. Press the "Next" button and wait for a moment







3. Choose the option "Yes, I want to restart my computer now", then click "Finish" button to reboot your computer.



Appendix A

Programming GPIO & Watchdog Timer

The board is equipped with a watchdog timer that resets the CPU or generates an interrupt if processing comes to a standstill for any reason. This feature ensures system reliability in industrial standalone or unmanned environments.

Appendix A Programming GPIO & Watchdog Timer

A.1 Supported GPIO Register

Below are detailed description of the GPIO addresses and programming sample.

A.1.1 GPIO Registers

CRF0 (GP10-GP17 I/O selection register. Default 0xFF)

When set to a '1', respective GPIO port is programmed as an input port.

When set to a '0', respective GPIO port is programmed as an output port.

CRF1 (GP10-GP17 data register. Default 0x00)

If a port is programmed to be an output port, then its respective bit can be read/written.

If a port is programmed to be an input port, then its respective bit can only be read.

CRF2 (GP10-GP17 inversion register. Default 0x00)

When set to a '1', the incoming/outgoing port value is inverted.

When set to a '0', the incoming/outgoing port value is the same as in data register.

Extended Function Index Registers (EFIRs)

The EFIRs are write-only registers with port address 2Eh or 4Eh on PC/AT systems.

Extended Function Data Registers (EFDRs)

the EFDRs are read/write registers with port address 2Fh or 4Fh on PC/AT systems.

A.1.2 GPIO Example program-1

```
------------------------------------------------
 Enter the extended function mode, interruptible double-write
------------------------------------------------
MOV DX,2EH
MOV AL,87H
OUT DX,AL
OUT DX,AL
------------------------------------------------------------------
Configure logical device 7(GP10~GP17), configuration register
CRF0,CRF1,CRF2
------------------------------------------------------------------
MOV DX,2EH
MOV AL,07H ; point to Logical Device Number Reg.
OUT DX,AL
MOV DX,2FH
MOV AL,07H ; select logical device 7
OUT DX,AL ;
MOV DX,2EH
MOV AL,F0
OUT DX,AL
MOV DX,2FH
MOV AL,00H  ; 01:Input  00:output  for  GP10~GP17
OUT DX,AL
MOV DX,2EH
MOV AL,F2H ;
OUT DX,AL
MOV DX,2FH
MOV AL,00H    ;Set GPIO is normal not inverter
OUT DX,AL;
MOV DX,2EH
MOV AL,F1H
```

```
OUT DX,AL
MOV DX,2FH
MOV AL,??H ;  Put the output value into AL
OUT DX,AL

-----------------------------------------
 Exit extended function mode |
-----------------------------------------
MOV DX,2EH
MOV AL,AAH
OUT DX,AL
```

A.2 Watchdog programming

Watchdog: (Index Port:300H , Data Port:301)

1, Enable Watchdog

Outportb (0x4e,0x77);

Outportb (0x4e,0x77); //Entry Configuration Mode

Outportb (0x4e,0x07); //Select Register Index 0x07

Outportb (0x4f,0x08); //Select LDN 8

Outportb (0x4e,0x30); //Select LDN 8 Register Index 0x30

Outportb (0x4f,0x01); //Enable Watchdog Timer Device

Outportb (0x4e,0xaa); //Exit Configuration Mode

2, Set Watchdog Timer to 20 Second Used Base Address 0x300~0x301

Outportb (0x300,0x03); Select Unit to One Second and clear Time out Status

; If 0x03 Change to 0x00 that Unit is 10 mini Second

; Or if change to 0x05 that unit is one minute

Outportb(0x301,0x14);

Outportb(0x301,0x14); //Set Timer to 20 Second and Enable Timer

3, Disable Watchdog

```
Outportb (0x4e,0x77);
Outportb (0x4e,0x77); //Entry Configuration Mode
Outportb (0x4e,0x07); //Select Register Index 0x07
Outportb (0x4f,0x08); //Select LDN 8
Outportb (0x4e,0x30); //Select LDN 8 Register Index 0x30
Outportb (0x4f,0x00); //Disable Watchdog Timer Device
Outportb (0x4e,0xaa); //Exit Configuration Mode
```

Appendix B

Pin Assignments

This appendix contains information of a detailed or specialized nature. It includes:

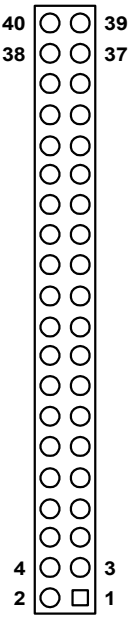
- Primary IDE Connector
- Floppy Connector
- Printer port Connector
- Secondary IDE (Slave) Connector
- ATX Power Connector
- COM port 3,4
- USB port 1, 2
- USB port 3, 4
- HDD LED/Reset/Power Button
- D-SUB VGA Connector
- LAN RJ45 Connector
- COM port 1, 2
- LVDS Connector
- AC'97 Interface Connector
- DI/O Connector
- MINI Keyboard Connector
- External Keyboard Connector
- LCD Inverter Power Connector
- CompactFlash Socket
- ATX Feature Connector
- -12V Power Connector

Appendix B Pin Assignments

B.1 Primary IDE Connector (CN1)

Table B.1: Primary IDE Connector (CN1)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	REQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	READY	28	Cable Select
29	DACK	30	GND
31	IRQ14	32	NC
33	A1	34	ATA check
35	A0	36	A2
37	CS1#	38	CS3#
39	Active	40	GND

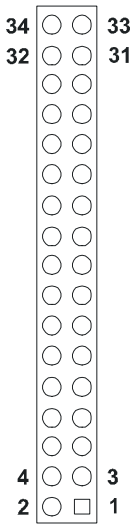


B.2 Floppy Connector (CN2)

Table B.2: Floppy Connector (CN2)

Pin	Signal	Pin	Signal
1	GND	2	RWC#
3	GND	4	NC
5	GND	6	DS
7	GND	8	Index#
9	GND	10	MOA#
11	GND	12	DSB#
13	GND	14	DSA#
14	GND	16	MOB#
17	GND	18	DIR#
19	GND	20	STEP#
21	GND	22	WD#
23	GND	24	WE#
25	GND	26	Track0#
27	GND	28	WP#
29	GND	30	RDATA#
31	GND	32	HEAD#
33	GND	34	DSKCHG#

*low active



B.3 Printer Port Connector (CN3)

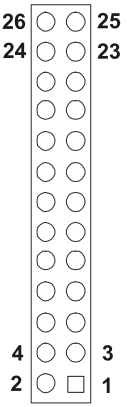


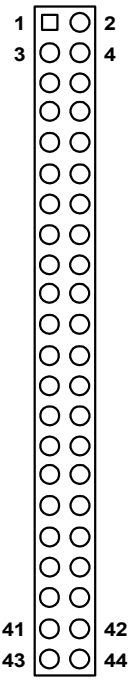
Table B.3: Printer Port Connector (CN3)

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	D0	4	ERR
5	D1	6	INIT#
7	D2	8	SLIN
9	D3	10	GND
11	D4	12	GND
13	D5	14	GND
15	D6	16	GND
17	D7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

B.4 Secondary IDE Connector (CN4)

Table B.4: Secondary IDE Connector (CN4)

Pin	Signal	Pin	Signal
1	IDE RESET	2	GND
3	D7	4	D8
5	D6	6	D9
7	D5	8	D10
9	D4	10	D11
11	D3	12	D12
13	D2	14	D13
15	D1	16	D14
17	D0	18	D15
19	GND	20	NC
21	REQ	22	GND
23	IOW	24	GND
25	IOR	26	GND
27	READY	28	Cable Select
29	DACK	30	GND
31	IRQ14	32	NC
33	A1	34	ATA check
35	A0	36	A2
37	CS1#	38	CS3#
39	Active	40	GND
41	+5V	42	+5V
43	GND	44	NC



B.5 ATX Power Connector (CN5)

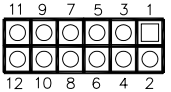


Table B.5: ATX Power Connector (CN5)

Pin	Signal
1	GND
2	GND
3	+5V
4	GND
5	+5V
6	5VSB
7	GND
8	PSON#
9	+5V
10	GND
11	+5V
12	+12V

B.6 COM port 3, 4 (CN6)

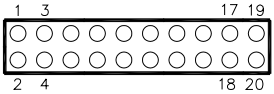


Table B.6: COM port 3,4 (CN6)

Pin	Signal	Pin	Signal
1	DCD3	2	DSR3
3	SIN3	4	RTS3
5	SOUT3	6	CTS3
7	DTR3	8	RI3
9	GND	10	GND
11	DCD4	12	DSR4
13	SIN4	14	RTS4
15	SOUT4	16	CTS4
17	DTR4	18	RI4
19	GND	20	GND

B.7 USB port 1, 2 (CN7)

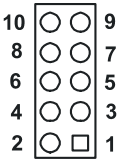


Table B.7: USB port 1, 2 (CN7)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	USB GND	8	USB GND
9	GND	10	NC

B.8 USB port 3, 4 (CN8)

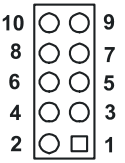


Table B.8: USB port 3, 4 (CN8)

Pin	Signal	Pin	Signal
1	+5V	2	+5V
3	USB0-	4	USB1-
5	USB0+	6	USB1+
7	USB GND	8	USB GND
9	GND	10	NC

B.9 HDD LED/Reset/Power Button (CN9)

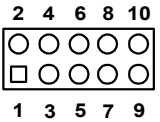


Table B.9: HDD LED/Reset/Power Button (CN9)

Pin	Signal	Pin	Signal
1	+5V	2	HDD_LED
3	+5V	4	GND
5	SUSPEND	6	5VSB
7	RESET	8	GND
9	5VSB	10	PWR_Button

B.10 D-SUB VGA Connector (CN10)

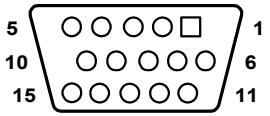


Table B.10: D-SUB VGA Connector (CN10)

Pin	Signal	Pin	Signal
1	R	9	+5V
2	G	10	GND
3	B	11	NC
4	NC	12	S-DATA
5	GND	13	HSYNC
6	GND	14	VSYNC
7	GND	15	S-CLK
8	GND		

B.11 LAN RJ45 Connector (CN11)

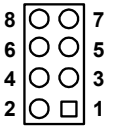


Table B.11: LAN RJ45 Connector (CN11)

10/100M			
Pin	**Signal**	**Pin**	**Signal**
1	TX+	5	NC
2	TX-	6	RX-
3	RX+	7	NC
4	NC	8	NC
10/100/1000M			
1	MDI0-	5	MDI2+
2	MDIO+	6	MDI2-
3	MDI1+	7	MDI3+
4	MDI-	8	MDI3+

B.12 COM port 1 (CN12)

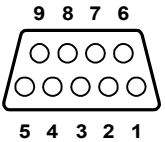


Table B.12: COM port 1 (CN12)

Pin	Signal
1	DCD
2	SIN
3	SOUT
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

B.13 COM port 2 (CN13)

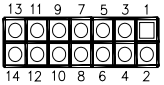


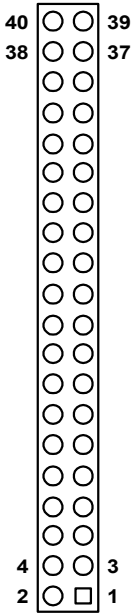
Table B.13: COM port 2 (CN13)

Pin	Signal	Pin	Signal
1	DCD	2	DSR
3	SIN	4	RTS
5	SOUT	6	CTS
7	DTR	8	RI
9	GND	10	NC
11	TXD422+/485+	12	TXD422-/485-
13	RXD422+	14	RXD422+

B.14 LVDS Connector (CN14)

Table B.14: LVDS Connector (CN14)

Pin	Signal	Pin	Signal
1	+5V/3.3V	2	+5V/3.3V
3	GND	4	GND
5	+5V/3.3V	6	+5V/3.3V
7	LVDS0_N0	8	LVDS1_N0
9	LVDS0_P0	10	LVDS1_P0
11	GND	12	GND
13	LVDS0_N1	14	LVDS1_N1
15	LVDS0_P1	16	LVDS1_P1
17	GND	18	GND
19	LVDS0_N2	20	LVDS1_N2
21	LVDS0_P2	22	LVDS1_P2
23	GND	24	GND
25	LVDS0_C0N	26	LVDS1_C0N
27	LVDS0_C0P	28	LVDS1_C0P
29	GND	30	GND
31	LVDS_DDCOCLK	32	LVDS_DDCPDATA
33	GND	34	GND
35	NC/ LVDS0_N3	36	NC/LVDS1_N3
37	NC/ LVDSS0_P3	38	NC/LVDS1_P3
39	NC	40	+0.3V Reference



B.15 AC'97 Interface Connector (CN15)

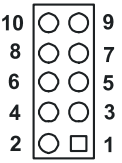


Table B.15: AC'97 Interface Connector (CN15)

Pin	Signal	Pin	Signal
1	+5V	2	BitCLK
3	DATA IN	4	GND
5	GND	6	Sync
7	DATA OUT	8	ACRST
9	+5V	10	NC

B.16 DI/O Connector (CN16)

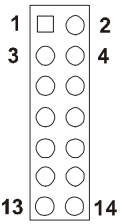


Table B.16: DI/O Connector (CN16)

Pin	Signal	Pin	Signal
1	IO0	2	IO4
3	GND	4	GND
5	IO1	6	IO5
7	+5V	8	NC
9	IO2	10	IO6
11	GND	12	GND
13	IO3	14	IO7

B.17 MINI Keyboard Connector (CN17)

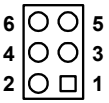


Table B.17: MINI Keyboard Connector (CN17)

Pin	Signal
1	KBDATA
2	MSDATA
3	GND
4	+5V
5	KBCLK
6	MSCLK

B.18 External Keyboard Connector (CN18)

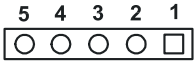


Table B.18: External Keyboard Connector (CN18)

Pin	Signal
1	KBCLK
2	KBDATA
3	NC
4	GND
5	+5V

B.19 LCD Inverter Power Connector (CN19)

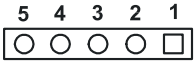


Table B.19: LCD Inverter Power Connector (CN19)

Pin	Signal
1	+12V output
2	GND
3	Back-light enable signal output
4	Back-light VBR signal output
5	+5V output

B.20 CompactFlash Connector (CN20)

Table B.20: CompactFlash Connector (CN20)

Pin	Signal	Pin	Signal
1	GND	26	#CD1
2	D3	27	D11
3	D4	28	D12
4	D5	29	D13
5	D6	30	D14
6	D7	31	D15
7	#CE	32	#CE2
8	A10	33	#VS14
9	#OE	34	#IORD
10	A9	35	#IOWR
11	A8	36	#WE
12	A7	37	#IRQ
13	VCC	38	VCC
14	A6	39	#CSEL
15	A5	40	#VS2
16	A4	41	RESET
17	A3	42	#WAIT
18	A2	43	#INPACK
19	A1	44	#REG
20	A0	45	BVD2
21	D0	46	BVD1
22	D1	47	D8
23	D2	48	D9
24	IOCS16	49	D10
25	#CD2	50	GND

B.21 ATX Feature Connector (CN21)

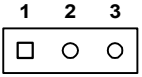


Table B.21: ATX Feature Connector (CN21)

Pin	Signal
1	VCCSB
2	GND
3	PS_ON#

B.22 -12V Power Connector (CN22)

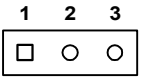


Table B.22: -12V Power Connector (CN22)

Pin	Signal
1	NC
2	GND
3	-12V

Appendix C

System Assignments

This appendix contains information of a detailed nature. It includes:

- System I/O ports
- 1st MB memory map
- DMA channel assignments
- Interrupt assignments

Appendix C System Assignments

C.1 System I/O Ports

Table C.1: System I/O ports

Addr. range (Hex)	Device
00-0F	Master DMA controller
20-21F	Master Interrupt controller
40-5F	Timer/Counter
60-6F	Keyboard controller
(60h)	KBC Data
(61h)	Misc Functions & Spkr Ctrl
(64h)	KBC Command/Status
70-77	RTC/COMS/NMI-Disable
78-7F	-available for system use-
80	-reserved-(debug port)
81-8F	DMA Page Registers
90-91	-available for system use-
92	System Control
93-9F	-available for system use-
A0-A1H	Slave Interrupt Controller
C0-DF	Slave DMA Controller
E0-FF	-available for system use-
100-CF7	-available for system use-
CF8-CFB	PCI Configuration Address
CFC-CFF	PCI Configuration Data
D00-FFFF	-available for system use-
200-20F	Game Port
2F8-2FF	COM2
378-37F	Printer Port (Standard & AFF)
3F0-3F1	Configuration Index/Data
3F0-3F7	Floppy Controller
3F8-3FF	COM1

Table C.1: System I/O ports	
Addr. range (Hex)	**Device**
778-77A	Printer Port (ECP Extensions)(Port 378+400)
MPU-401 select from 300 ~ 330H (2 bytes)	

C.2 1st MB memory map

Table C.2: 1st MB memory map	
Addr. range (Hex)	**Device**
F0000h - FFFFFh	System ROM
*CC000h - EFFFFh	Unused (reserved for Ethernet ROM)
C0000h - CBFFFh	Expansion ROM (for VGA BIOS)
B8000h - BFFFFh	CGA/EGA/VGA text
B0000h - B7FFFh	Unused
A0000h - AFFFFh	EGA/VGA graphics
00000h - 9FFFFh	Base memory

* If Ethernet boot ROM is disabled (Ethernet ROM occupies about 16 KB)

* E0000 - EFFFF is reserved for BIOS POST

C.3 DMA channel assignments

Table C.3: DMA channel assignments

Channel	Function
0	Available
1	Available (audio)
2	Floppy disk (8-bit transfer)
3	Available (printer port)
4	Cascade for DMA controller 1
5	Available
6	Available
7	Available

* Audio DMA select 1, 3, or 5

** Printer port DMA select 1 (LPT2) or 3 (LPT1)

C.4 Interrupt assignments

Table C.4: Interrupt assignments

Interrupt#	Interrupt source
IRQ 0	Interval timer
IRQ 1	Keyboard
IRQ 2	Interrupt from controller 2 (cascade)
IRQ 3	COM2
IRQ 4	COM1
IRQ 5	Unused
IRQ 6	FDD
IRQ 7	LPT1
IRQ 8	RTC
IRQ 9	Reserved (audio)
IRQ 10	Unused
IRQ 11	Reserved for watchdog timer
IRQ 12	PS/2 mouse
IRQ 13	INT from co-processor
IRQ 14	Primary IDE
IRQ 15	Secondary IDE for CFC

* Ethernet interface IRQ select: 9, 11, 15
* PNP audio IRQ select: 9, 11, 15
* PNP USB IRQ select: 9, 11, 15
* PNP ACPI IRQ select: 9, 11, 15

Appendix D

SpeedStep Technology

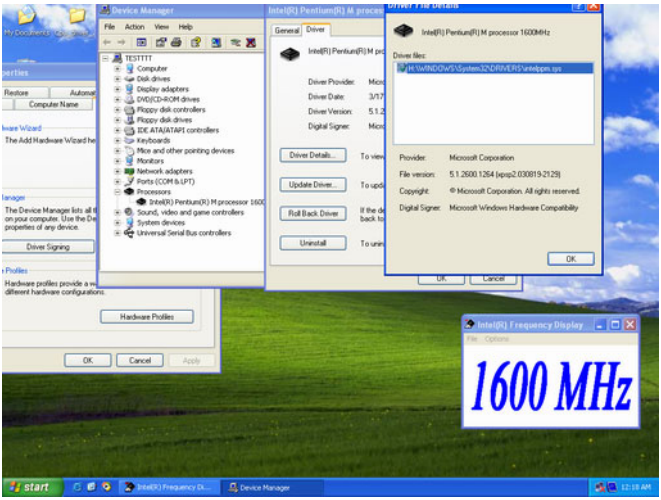
Appendix D SpeedStep Technology

D.1 Intel® Pentium® M SpeedStep instruction

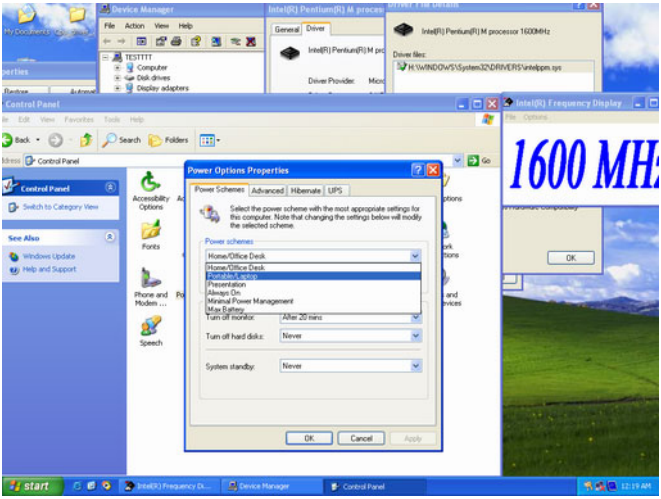
Mobile Intel® Pentium® M processors with Enhanced Intel SpeedStep® technology let users customize high performance computing on their PC.The Enhanced Intel SpeedStep technology provides the Pentium M processor a flexible, multi-point operating mode, completely self managed, and with a very low CPU and memory unavailability time, which optimizes its power and performance according to demand.

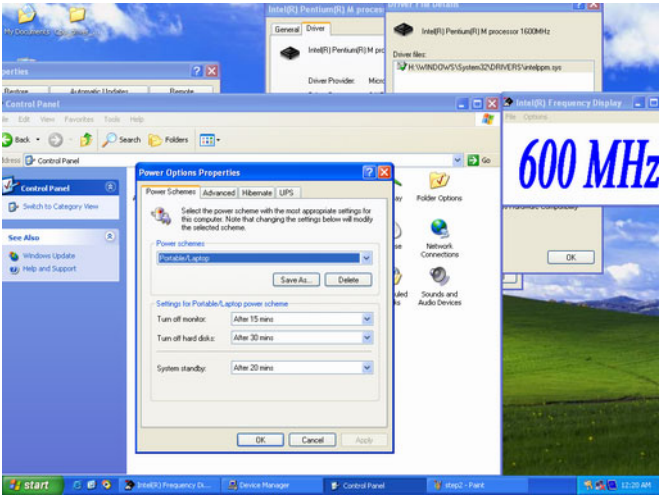
Advantech's product with Intel® Pentium® M processors support speed stepping feature at Windows XP, To implement the speed stepping feature under Windows XP, please follow the listed steps:

Step 1. Update "Processor" driver by using "cpu_driver_winxp.zip"

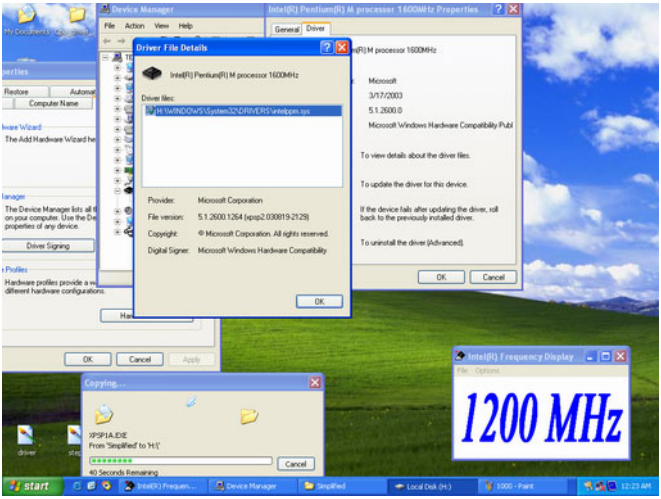


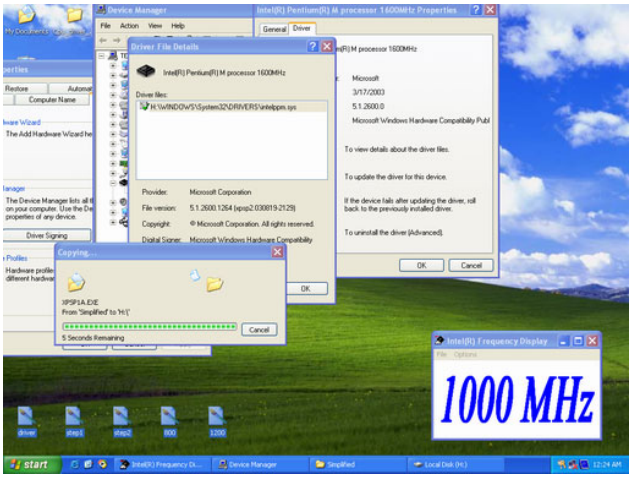
Step 2. Change “Power schemes" to "Portable/Laptop”

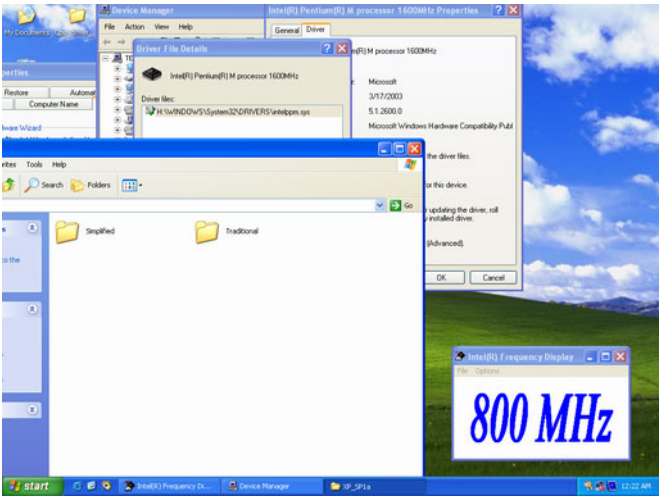




Step 3. Discover the different CPU freq. by using Frequency Display utility







The Result of Pentium M speed stepping:

1.1 G---600 MHz / 800 MHz / 1.1 GHz (Intel® Pentium® M)

1.6 G---600 MHz / 800 MHz / 1.0 GHz /1.2 GHz / 1.4 GHz / 1.6 GHz (Intel® Pentium® M)